Rock Products

THE INDUSTRY'S RECOGNIZED AUTHORITY

OCTOBER 1957



Largest nonatomic explosion page 102

Are you getting your money's worth from trade associations? page 98

2000 TPD for 9 to 12 Months — A Total of 730,000 Tons Before Replacing Impellers and Liners

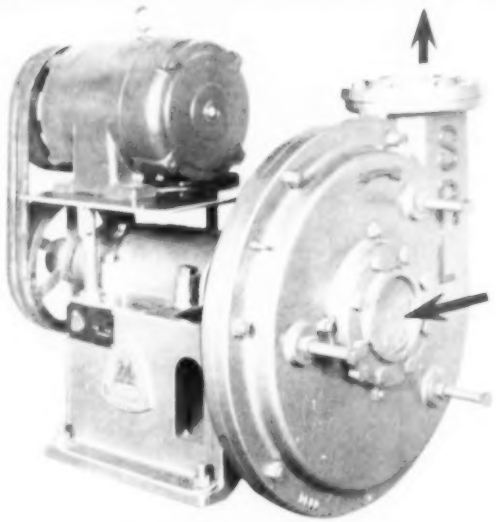


DENVER SRL Rubber Lined Pumps TAKE the punishment at La Luz Mines, Ltd.

La Luz Mines, Ltd., Nicaragua, installed a 6" x 6" DENVER SRL Pump in 1940 to handle 2000 TPD classifier overflow from three ball mills to distributor box ahead of flotation section. In 1941 they installed another 6" x 6" DENVER SRL Pump for a standby. Pumps are run alternately one week each so impeller and liner life will be even. By alternating the pumps, the runners and liners last from 18 to 24 months, or the equivalent of 9 to 12 months continuous service for each pump before replacement parts are necessary. Screen analysis of classifier overflow runs 36.6% + 65 mesh.

In addition to these two pumps, La Luz Mines uses 10 3" x 3" DENVER SRL Pumps and two 5" x 4" DENVER SRL Pumps.

For complete details on how you can lower your abrasive pumping costs with dependable DENVER SRL Pumps, write for bulletin P9-B10 Pumps and parts in stock.



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B.F.Goodrich report:



Now they burn coal refuse to make lighter building blocks

B. F. Goodrich improvements in rubber brought extra savings

Problem: Those steaming hot cinders on that conveyor belt are burned coal refuse. Once thrown away as useless, the refuse is now used to make an improved, lightweight building block.

After cooking at a white hot 2500 degrees, the cinders are sprayed with water, but are still plenty hot when they're dumped on the conveyor belt to be carried to storage. This heat, plus the wear and tear from sharp, jagged cinder edges, ruined a belt made of asbestos in only 30 days.

What was done: When a B.F.Goodrich distributor heard of the problem, he recommended a B.F.Goodrich belt that's made to carry such hot materials as coke, hot sand, lime. This belt is made with a special heat-resisting rubber that can stand temperatures that would char or burn ordinary rubber belts.

Savings: The B.F.Goodrich belt was put to work and lasted 20 months—far longer than the asbestos belt it replaced. The belt worked around the clock, 7 days a week, carrying 120 tons of hot cinders a day. There was not one shutdown for maintenance or repairs.

Where to buy: Your B.F.Goodrich distributor has the exact specifications on the belt that solved the problem in this plant. And, as a factory-trained specialist in rubber products, he *can* answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-188, Akron 18, O.*

B.F.Goodrich

INDUSTRIAL PRODUCTS

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OCTOBER 1957

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A DOUBLE TRAILER TANDEM RIG with EASTON TD-1222H trailers.

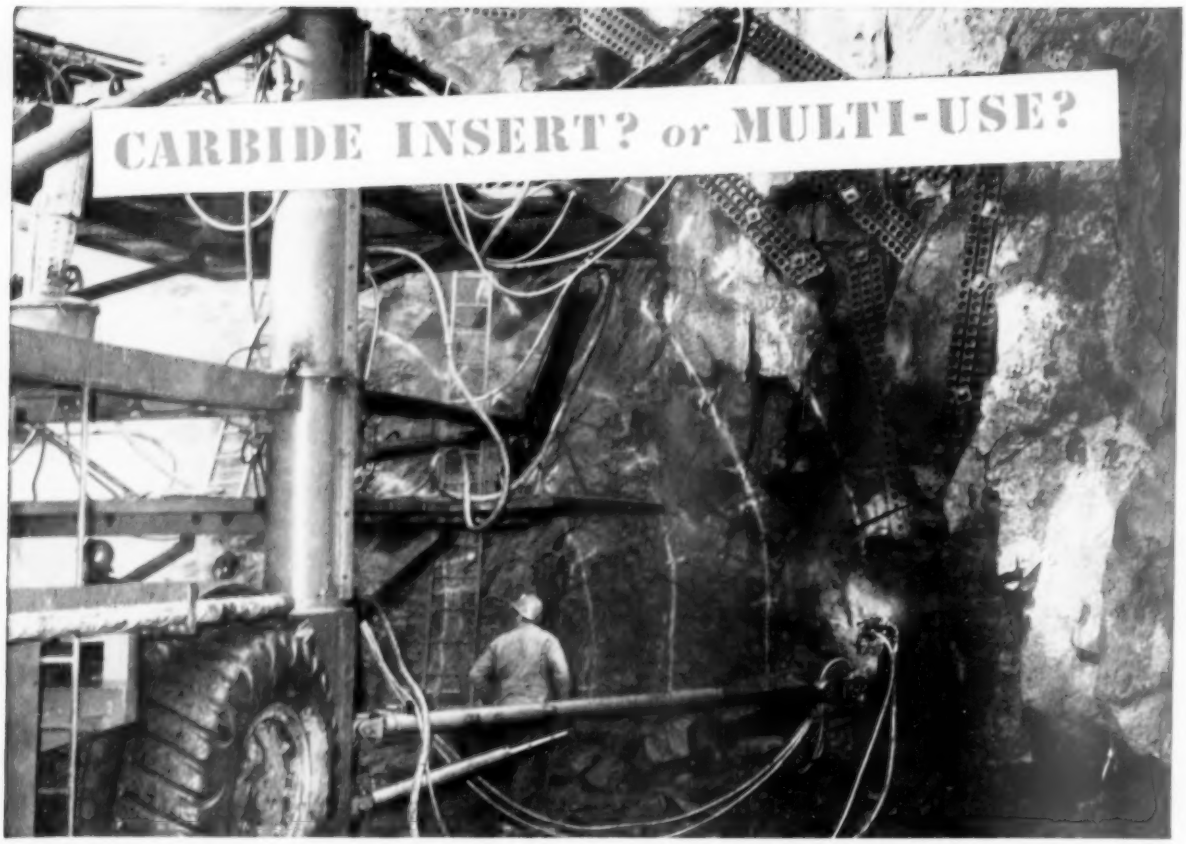
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LOCATION: Mayfield Dam site, near Saukum, Washington. **OPERATING CONDITIONS:** Medium blocky basalt.

Increased drilling speed with TIMKEN® carbide insert bits saves time, labor on Mayfield Dam tunnel

DRILLING a diversion tunnel for the city of Tacoma's Mayfield Dam, Gibson and Roberts, rock drilling specialists of Yardley, Washington, had to chew through medium blocky basalt. For highest economy drilling through this hard ground, they used Timken® carbide insert rock bits with their jumbo drill rig.

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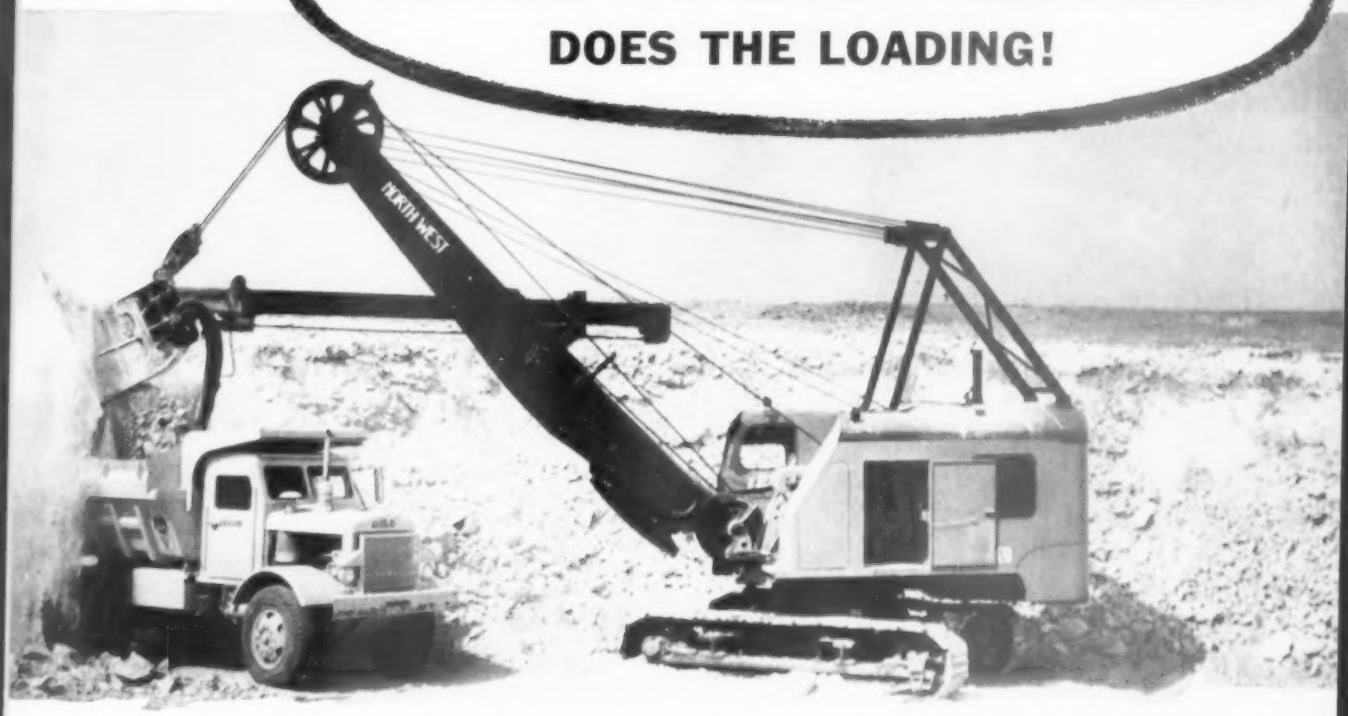
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IT'S A HIGH OUTPUT CRUSHING JOB WHEN A *NORTHWEST* DOES THE LOADING!



This big Northwest 80-D, 2½ yd. Shovel is loading trucks to feed a Cedarapids Crushing plant. It is loading caliche for Henry L. Stafford of Lubbock, Texas, and the combination of high performance and ideal conditions is producing phenominal output.

Phenominal output is always dependent on conditions and Northwests are built to meet conditions as you find them. Northwests are rock shovels, built to handle the toughest kind of jobs — built to assure the highest output that conditions permit.

Northwests have that desirable characteristic of always being ready to go. Get up on a Northwest sometime if you know operation. Get the feel of the controls yourself. Feel that crowd take a-hold. The dipper goes right on through as the hoist takes it up — no "re-starts" are required here. It's a full load in one cut. Remember the Northwest Dual Independent Crowd utilizes force most other independent crowd shovels waste — force that puts greater effectiveness at the dipper lip for handling tougher digging and producing more output. To Northwest digging power add the "Feather-Touch" Clutch Control which brings ease of operation without the complications of pumps, piping and compressors; the Cushion Clutch that eliminates shovel overloads before the damage is done; Uniform Pressure Swing Clutches that cut spotting time by eliminating the jerks and grabs in swinging; Northwest simplicity of design that makes upkeep easy and reduces "down time"; and all other Northwest advantages that make Northwest a *real* Rock Shovel.

You can plan to have a Northwest. Now is the time to find out about Northwest design and operation. Why not talk it over with a Northwest Man?



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NEW SAUERMAN SLACKLINE CABLEWAY INCREASES PRODUCTION OVER 25%



Bucket breaks water with heaping load from a 100 ft. depth...

Wherever deep digging is required and operating spans are long, the new Sauerman Slackline is adding to its margin of superiority over other types of excavators. Production increases of over 25% and in some unusual cases as high as 80% are reported.

Not only is production increased but operating costs are lowered as cable and hoist wear is reduced and the machine runs with fewer peak loads and shocks—all possible from a cushioned drive using a torque convertor and other refinements.

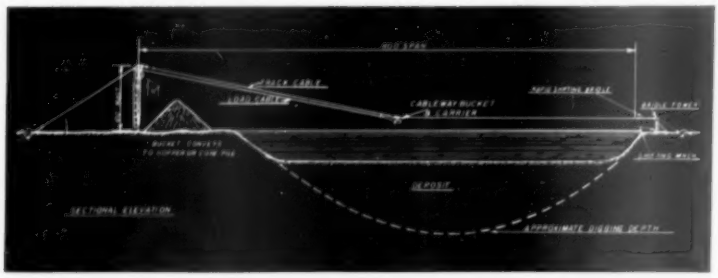
These benefits are also available to present owners of slackline cableways. Guaranteed Gravel & Sand Co., a Sauerman Slackline user for over 35 years, has increased hoist speeds from 230 to 350 fpm. on the digging cycle and conveying speed to 800 fpm.—a gain of 25%. Guaranteed's 2-cu. yd. bucket is digging 450 ft. away from the surge pile and delivers 150 cu. yds. per hr.

The Sauerman Method lets you work distant material—up to 1,000 ft. away and dig 100 ft. or more below water. Now more than ever the greater tonnage available through fluid drive operation makes a Sauerman Slackline Cableway the low cost way for deep digging.

Get the best machine for your job. Write to Sauerman for expert advice on any materials handling project. For additional information on slackline cableways, ask for Catalog C.



is conveyed and dumped automatically at surge pile.



Above drawing was prepared for a specific slackline installation and does not represent maximum spans. Rapid shifting bridle is not needed for many deposits.



Guaranteed Gravel and Sand Co.'s slackline bucket dumps 150 cu. yds. per hr. on surge pile from digging point 450 ft. away.

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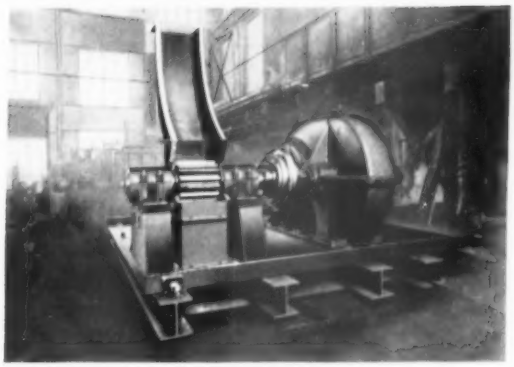
is engineering advancement ✓



9'-6" diameter x 375'-0" Traylor Rotary Kiln in a Portland Cement plant.



Plant installation of 9'-6" diameter x 250'-0" Traylor Rotary Kiln in Portland Cement plant.



Illustrated is one type of Traylor's Pinion Mountings with the gear guard removed.

—Traylor engineering experience in the building of kilns satisfies the demand upon process industries for greater production, and offers many advantages. One Traylor-Made kiln advancement is the "full-floating" type of tire. Special mounting of these tires holds them securely in place but permits them to float free of the shell as it contracts and expands.

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KOEHRING WORK CAPACITY *in action* . . .



A new 2-yard — Latest addition to the big Koehring line of excavators for mining and quarrying is this new 805. It's a heavy-duty 2-yard machine, with 25-foot deep-section shovel boom, and 18½-foot dual dipper sticks. You'll like the 805's power, strength, stability in heavy digging — and *extra capacity* as a dragline or crane for stripping, stockpiling, lifting. It handles 2 to 3-yard dragline bucket — lifts up to 52 tons.

"Diving" for gravel — Loading out of a water-filled gravel pit (right), this 405 dragline puts production on a big-tonnage basis. It has plenty of work-radius for this type of operation — can be used with 40 to 90 feet of boom, and handles 1 to 1½ cu. yd. bucket depending on weight of materials. Check its other work capacities on opposite page, then let your Koehring distributor show you what the 405 will do for you.

Re-working a slag bank — Once cast aside as waste, slag is now being reclaimed from this bank, run through a crusher, and used as sub-base material on road construction. During the process, slag is swept by a magnet to remove any scrap metal. Here, a Koehring 1½-yard 605 shovel loads the slag into Dumptors for haul to crushing plant. This combination of Koehring shovels and Dumptors makes a heavy-duty, high-production team. 6-yard Dumptor® climbs 24% grades fully loaded, dumps in one second, travels at same high speeds in either direction — no need to turn.



Mining copper ore — At this open-pit mine in the Southwest, overburden has been stripped down to pay-dirt. Next, a Koehring ½-yard 205 loads out copper-bearing ore for haul to smelter. Powerful crowd, fast retract, smooth swing, and instant dipper-trip speed production in the pit, keep trucks on the run.





Here are some figures that will interest you:

KOEHRING MODEL	SIZE DIPPER	LIFT CAPACITIES (Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load.)	
205 CRAWLER	½-Yd.	30,000 lbs.	at 10-ft. radius
205 ON RUBBER	½-Yd.	30,000 lbs. 14,600 lbs.	at 12-ft. radius at 20-ft. radius
305 CRAWLER	¾-Yd.	30,000 lbs.	at 12-ft. radius
305 ON RUBBER	¾-Yd.	50,000 lbs. 15,800 lbs.	at 10-ft. radius at 30-ft. radius
405 CRAWLER	1-Yd.	40,000 lbs.	at 12-ft. radius
445 ON RUBBER	(Crane only)	90,000 lbs. 40,000 lbs.	at 15 ft. radius at 25-ft. radius
605 CRAWLER	1½-Yds.	72,300 lbs.	at 12-ft. radius
805 CRAWLER	2-Yds.	104,200 lbs.	at 12-ft. radius
1205 CRAWLER	3-Yds.	190,000 lbs.	at 12-ft. radius

Want more information? *See Koehring distributor.*

KOEHRING DIVISION OF KOEHRING COMPANY, Milwaukee 16, Wis.

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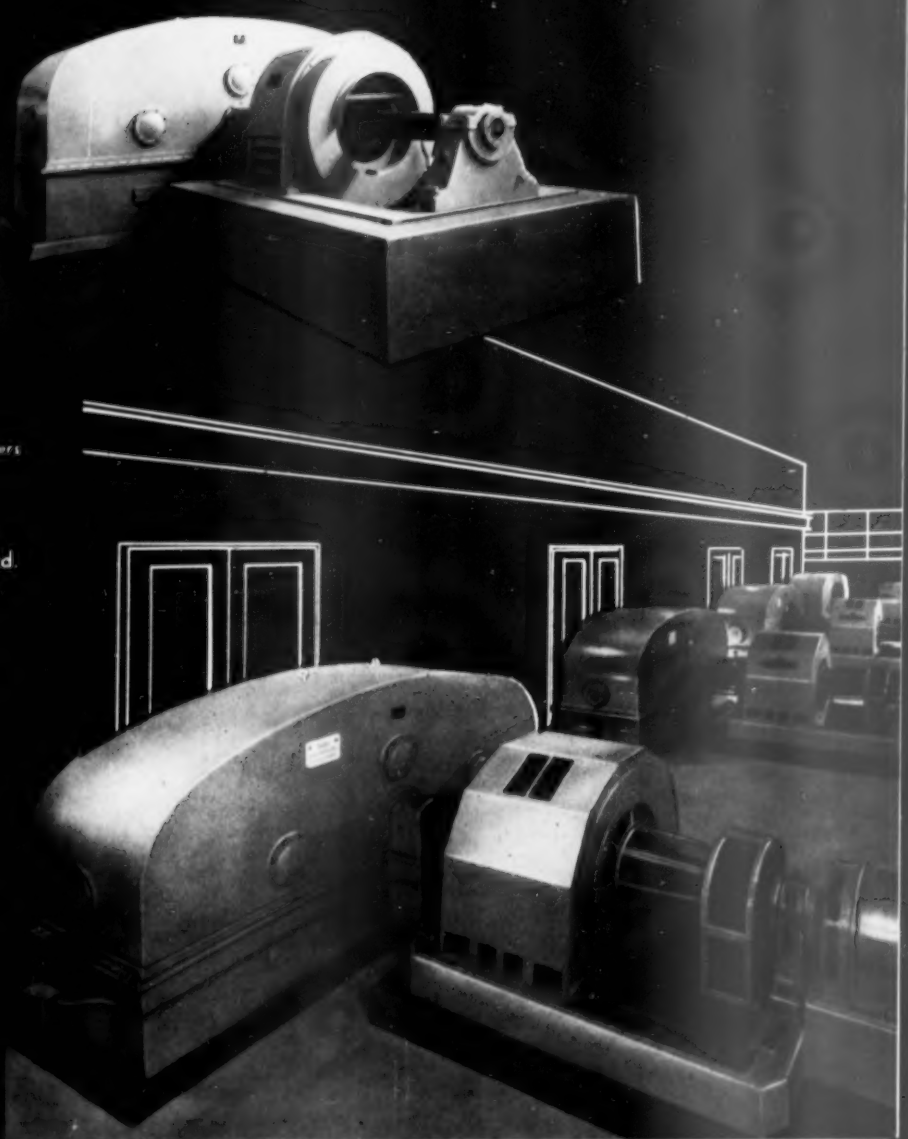
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What's Happening

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

October, 1957

Nearly a million pounds of glass beads will have been used to paint traffic lines on 14,000 miles of Pennsylvania roads and highways this past summer. The Pennsylvania Highway Department estimates that each mile of road will require about 17 gal. of paint and about 6 lb. of glass spheres. Guide lines are painted with an automatic spray machine which paints a 4 in. wide band at the rate of 6 to 7 mph. The bead placing device on the same machine immediately dusts the wet paint with the glass beads. Crosswalks and signs are painted on the road and dusted with glass beads by hand. Pennsylvania traffic engineers are convinced that this process greatly improves guide line visibility under hazardous driving conditions.

The coal industry was described as "sick", beset with economic ills, unemployment and faced with an uphill struggle for survival, according to a report of the subcommittee of the House of Representatives' Interior committee. The group recommended that depletion allowance rates for both anthracite and bituminous producers be changed to provide them with adequate reserves for research and for exploration. They also urged that the government set up an independent commission to develop new uses for coal, improve and expand existing markets for coal, reduce costs of production and distribution, emphasizing developments of particular value to the small producer.

One of the biggest "roofing" jobs on record was the sealing of the upstream face of the new Loch Quoich dam in Scotland. About 27 tons of a specially prepared rubberized bituminous compound were used to cover the faces and joints of the slabs on the steeply inclined face. The compound retains its elasticity from below freezing to over 85 deg. F., adheres perfectly to the concrete as well as to the copper water seals between the slabs, and will not flow down the steep slope of the dam at the top temperature.

The $4.4 billion of new construction put in place during July was practically unchanged from July 1956, and was off about two percent from June's total, according to the Departments of Labor and Commerce. The sharp seasonally-adjusted decreases reported in highway construction, nonresidential, and sewer and water works were attributed to the cement strike during July. New construction put in place during the first seven months of 1957 was nearly $26 billion, only slightly higher than the 1956 period. Public construction of $7.5 billion for the seven months was up about nine percent, but this was offset in the total by a reduction in the value of home building and store construction.

Deposits of ilmenite suitable for paint pigments have been found under wide areas of New Jersey. This will be a real boon to that state's paint industry which has had to import paint making pigments from deposits in Florida, New York, Canada and India.

WHAT'S HAPPENING

A new abrasive which may eventually replace sandpaper in industrial applications has been placed on the market by Skil Corp. of Chicago. It is produced by brazing various grain sizes of diamond-hard tungsten carbide to steel. The new abrasive tools are available in discs, sheets, plates, rods and sleeves for contour grinding. The manufacturer claims that the new abrasives will outlast sandpaper many times over, and that they will not melt, chip or fuse and will not become clogged or gummed in use. The most immediate application will be in the plastics industry where these characteristics are most valuable. Tungsten carbide is a synthetic abrasive, not known to occur naturally and is produced commercially in electric arc furnaces.

More than 180 million tons of low-grade magnetite iron ore has been blocked out for development in the Kirkland Lake area of northern Ontario by Jones and Laughlin Steel Corp. of Pittsburgh. The deposit, in the gold-mining area of Ontario, probably has a billion tons of iron ore available. J & L has had many years of experience processing low-grade iron ores to prepare them for blast furnaces. The new development will probably be an open-pit operation and plans call for a concentration and pelletizing plant to upgrade the 20 percent ore at the rate of about a million tons annually.

Existing toll roads accepted into the 41,000-mile proposed Federal interstate highway system amount to 2,102 miles in 15 states according to Federal Highway Administrator B. D. Tallamy. Not included were most sections of the New Jersey Turnpike, the West Virginia Turnpike and the Northeast Turnpike Extension in Pennsylvania. Still to be resolved by future action of the Congress are the questions of whether the Federal government should pay for these roads, who should get the money and if the roads should be made toll-free.

Metal roofs to heat homes are being tested experimentally on a dozen homes by several large aluminum producers. Blackened, specially treated aluminum sheets on the roof of a building absorb the sun's heat and transmit it to a circulating water system to heat the house. While it may be a year or more before the tests have been completed and the system can be offered to home builders, the makers admit that the new development can only be a standby heating system in climates without much sunlight during the winter months.

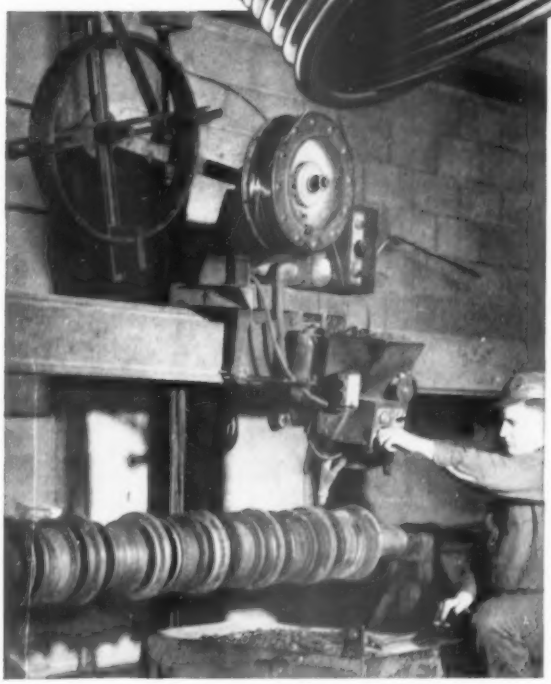
Gasoline from a nonpetroleum base material is now being produced at the rate of about 1,300 bbl. a day from the new $13 million refinery American Gilsonite Co. recently put on stream near Grand Junction, Colo. The new refinery produces metallurgical coke and ammonia in addition to gasoline. Gilsonite is a solid, nearly pure saturated hydrocarbon.

India has discovered vast new deposits of thorium and ilmenite in the Ranchi plateau. This has stimulated greater activity of that country's atomic energy development, since the new deposit is believed to be much greater than the Travancore coast. Reserves are estimated at over 3 million tons of thorium ore and nearly 100 million tons of ilmenite. The thorium oxide, uranium oxide and titanium extracted from these ores will be used to supply new and existing atomic reactors in India.

The editors

HAYNES Alloys solve the *tough* wear problems





. . . Especially suited for protection of such parts as tractor rolls and idlers, rock crushing rollers, shafts, sleeves.

Something NEW in HARD-FACING COILS

Newly developed drawn tube rod in coils as easy to apply as solid wire . . .

HAYNES hard-facing rods in coils give you uniformly hard deposits and smoother feeding—yet cost the same as ordinary tube rod. They also assure steadier deposition rates . . . can be used with standard equipment without nozzle change . . . meet standard wire tolerances for roundness and concentricity . . . and withstand the same feed roll pressures as solid wire.

They are available in six alloys for superior protection against abrasion and impact. For complete information send for descriptive booklet. Write HAYNES STELLITE COMPANY, A Division of Union Carbide Corporation, Kokomo, Indiana.



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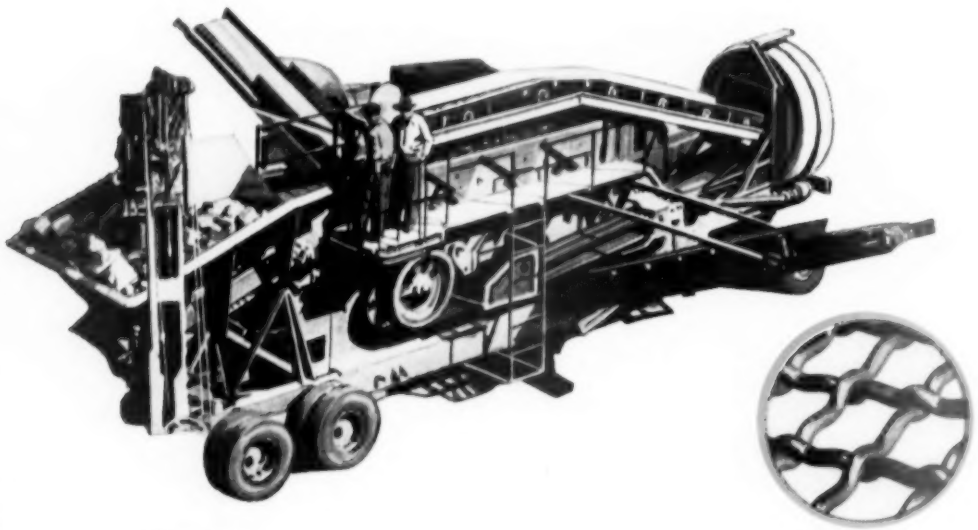
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EDITOR'S PAGE

HELP! Industry needs it on depreciation

A BAD PROBLEM WILL GET WORSE, businessmen feel, unless Congress gets more liberal with depreciation charges.

American businesses—including yours—will lose $6 billion this year in false profits because of a 20-year period of so-called "creeping" inflation. A worn-out viewpoint in Washington toward equipment depreciation allowances is the reason for it, and company prexies are staying awake nights to find a good way out of the dilemma.

High profit statements, says a series of articles in **The Journal of Commerce,** have been made because depreciation on equipment is figured on the basis of low original cost instead of high replacement cost caused by inflation.

The problem is of great concern to your industry, especially cement which has a low turnover of invested capital. Let's review the facts on equipment and construction costs in the cement industry, and see what inflation has done to them.

If you built a plant in 1932 that cost $10 million and depreciated it on a 25-year basis, you should have $10 million in the cash drawer now for plant replacement. The staggering fact is that the same plant would cost you $29 million today. Why? Equipment and construction costs are now about three times what they were in 1932.

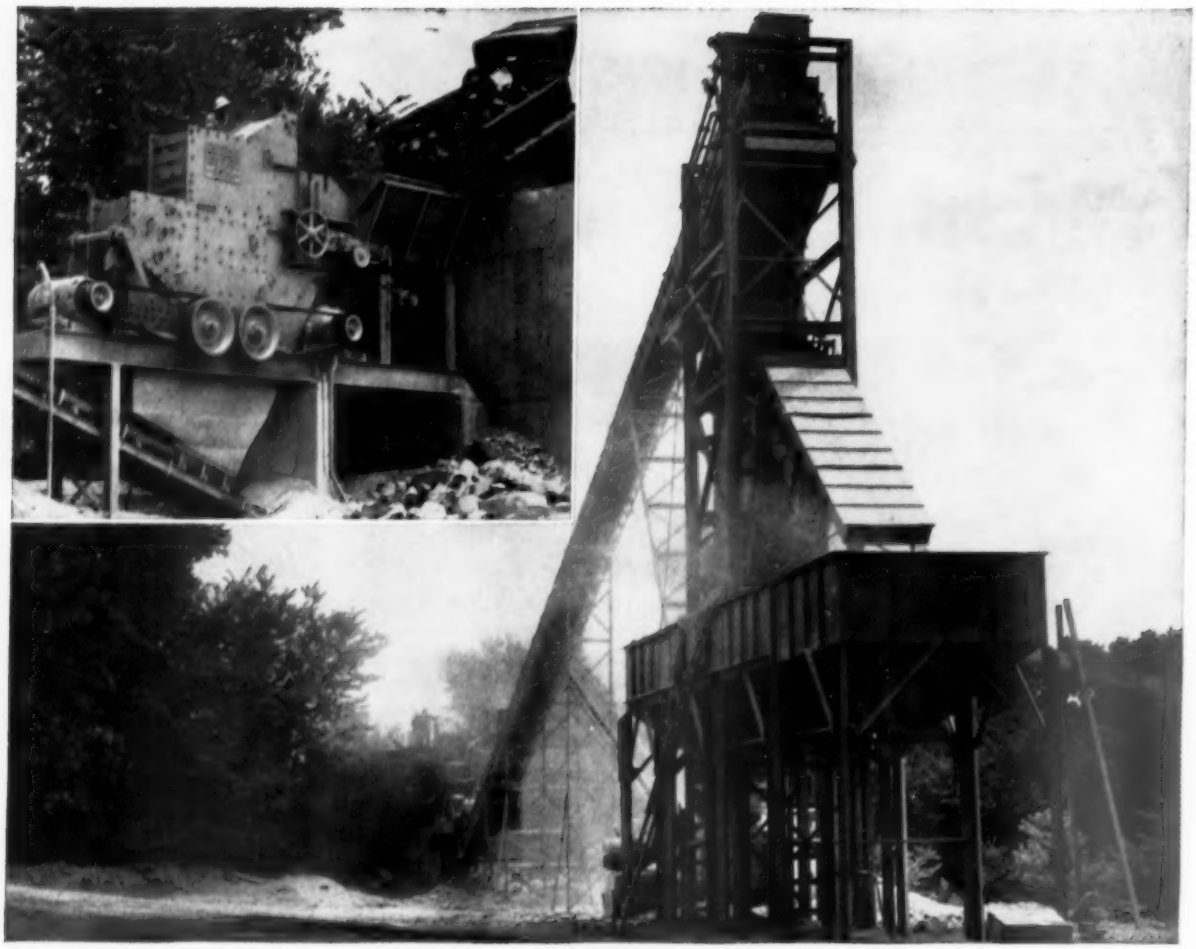
Look what it can mean to your projected plans for expansion! In another 10 years that $29 million plant will cost nearly $50 million—assuming a continued seven-percent annual increase in costs of equipment and construction.

The Journal of Commerce gave four possible tools that you can use in awaking from this financial nightmare. (1) Raise prices **over and beyond** a raise required to offset higher cost of labor, purchased goods and services. (2) Raise new capital for the replacement of old equipment. (3) Reduce dividends. (4) Seek new legislation that would bring in line depreciation allowances that are more realistic in light of inflationary experience.

Only the latter method seems the most equitable. Some foreign governments have seen the light and eased the burden on industry. Your government has recognized the effect of inflation in liberalizing Social Security benefits. Labor unions have recognized it, too, and put "standard of living" clauses in their contracts.

The way seems clear that Congress should give you relief by allowing equitable depreciation rates—if it hopes to get the growth and progress it expects.

George C. Lindsay



"Our Universal 3240 Impact Master Put a Quarry Back in Business"

says Ed Lundin, New Ulm Redstone Quarry Co., New Ulm, Minnesota

"The New Ulm Redstone Quarry hadn't been worked for 30 years. The material here is Sioux Quartzite — about 98% pure Silicon, one of the most abrasive minerals known. Competition from cheaper aggregates kept the quarry closed until new road building developments in Minnesota made us take another look.

"We knew this material would produce 'Class A' road stone, if we could just get crushing efficiency to meet competition. It breaks into slivers with pressure-type crushers, so we needed an impact-type to give us a cubical product.

"After a thorough study of wear and maintenance costs on impact-type crushers, we bought a Universal 3240 Impact Master. This plant crushes Redstone at *less than half* our expected cost per ton for maintenance — and its production is so high, we're adding another secondary crusher to handle its output.

"Our Universal not only put this quarry *back* in business — it's going to keep it in business!"

There are design differences in impact-type crushers you should know about, for these mean the difference in performance and maintenance costs. We'd like to tell you about the design difference that makes Universal the most frequent choice — tell you why the success of Ed Lundin's operation in Sioux Quartzite is directly related to his use of a Universal Impact Master.

Ask for the Universal story on "Controlled Impact Action."

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ROCKY'S NOTES

NATHAN C. ROCKWOOD



The chemistry of cement and concrete. Part III

WE ARE GIVING A LOT of space to a book review, but the book is a very important one to our industry.* It has no comparable text in the English language. It was written by independent experts; consequently the opinions expressed are not predicated on the idea that portland cement, even as now made, is not above possible improvement. This fact is particularly significant in the part of the book we are here referring to—the use of pozzolans and blast-furnace slag as ingredients of blended portland cements. There has been, and still is, much prejudice against the manufacture of such cements in this country on the part of the portland cement industry. Hence, reliable data on their virtues, and honest discussions of their shortcomings, are hard to obtain.

Our authors use the term a "pozzolana," whereas most American literature uses "pozzolan," which in our own estimation is the preferable term, at least when used in the singular sense. The chief impression one gets from the chapter on natural pozzolans is that there is no sure-fire method of determining how to select a satisfactory one. Some are good in the raw state, and some have to be heat treated. In what we call "blended cements," the results vary also with the particular cement. Our authors appear convinced that the reaction between a pozzolan and the cement is more than an adsorption of the free calcium hydroxide from the hydrated cement by the pozzolan.

The use of pozzolans with lime is described in considerable detail. European mortar cements have been made by such mixtures for centuries, with very satisfactory results, but in spite of their virtues and our constant agitation of this subject, no lime manufacturer in this country, so far as we know, has ever tried marketing a masonry cement made of such a mixture, with a single exception of a very well known brand which employs a lime-slag mix.

Our authors assume that ground sandstone or pulverized sand, used in some early American "sand-cements" had no pozzolanic properties. Here, they have accepted the usual opinions of our own cement experts, that the Elephant Butte and Arrowrock dams of the U. S. Reclamation Service owe their special virtues as concrete structures merely to the finer grinding of the cement. Nowhere here, or elsewhere, in the literature written by the experts do we find a notation that the presence of an alkali salt will render almost any form of silica reactive. In all probability the cement used in these famous American dams was a high-alkali cement, or the sandstone or granite that was pulverized with the cement or used as an aggregate contained the necessary sodium or potassium salts.

Shrinkage—One standard argument against the use of pozzolans in this country is that portland-pozzolan cement concretes tend to shrink more than plain portland cement concretes. European experience with such cements has been far more extensive than ours. This is what our authors conclude: "The expansion of portland cement mortars and concretes in water, and the reversible moisture movement, are little influenced by the substitution of pozzolans for cement, but the initial drying shrinkage usually tends to be slightly increased. It has been found in practice in mass concrete construction that pozzolanic cement concretes show better behavior in respect of cracking than ordinary portland cements. They share this property with low heat portland cements and it arises not merely from a reduced thermal contrac-

Please turn to page 77

*"The Chemistry of Cement and Concrete," by F. M. Lea and C. H. Desch. St. Martin's Press, Inc., 103 Park Ave., New York 17, N.Y.; Price $15.00.

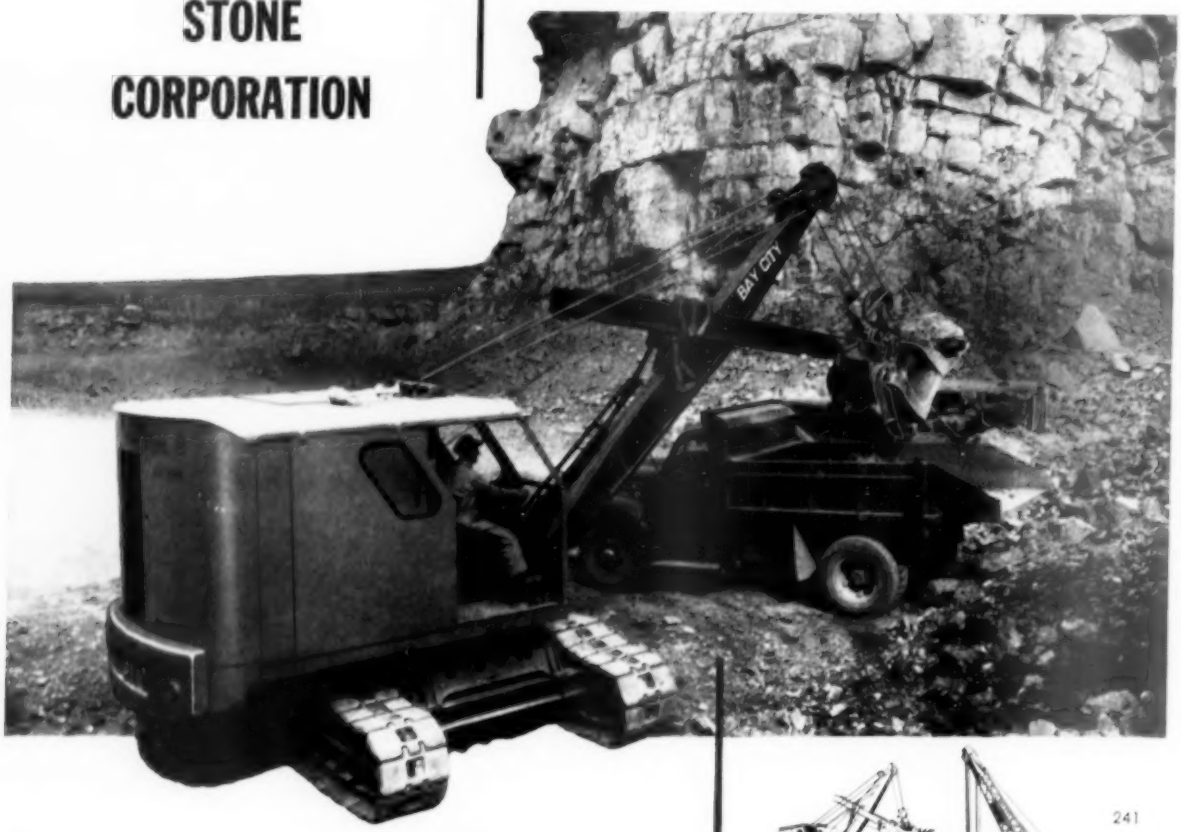
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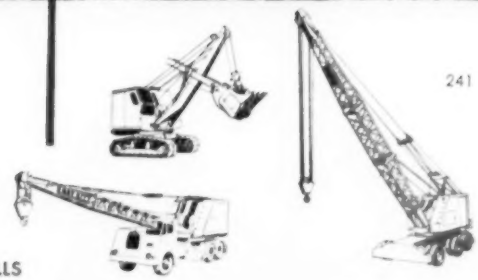
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Washington Letter

Edgar Poe

Cement union Demands The Chamber of Commerce of the United States reports that this year, for the first time, the cement union is making almost the same wage demand on every company in the cement industry. The Chamber said that a check showed that the demand was being made without regard for differences in local business operations. Pointing out that this is called "pattern" bargaining, the Chamber contends that the practice is driving many small firms out of business, thus lessening competition.

Companies are bound by anti-trust laws. On the other hand a union is not. As long as the union does not combine with a nonlabor group, it is exempt from the anti-trust laws. The Chamber maintains that labor is now more powerful than business, and that the unions can close down a company with "unfair practices and get away with it."

Airstrip Paving Materials Plans are complete to begin testing at Columbus, Miss., asphalt-paved airstrips to see how they hold up for big military aircraft as compared with concrete.

The accelerated traffic tests will be conducted under the direction of the Chief of Army Engineers. The tests grow out of hearings requested by a special investigating committee of the House Armed Services Committee.

An interim committee report on airstrip paving materials said that the Air Force has represented, in the course of its testimony, that increased loads by reason of the "channelized" traffic (repetitive use of the same areas) caused breakdowns on taxiways and runways. As a result the Air Force proposes that portland cement concrete be substituted as an exclusive material for these areas.

At the end of runways and on taxiways, the problem is that of dealing with a full loaded plane, whereas on the center portion of runways, the craft is partially airborne on take off and less heavy on landing.

"We have heard representatives of the asphalt industry, the Portland Cement Association, several independent contractors and engineers, representatives of the Department of the Air Force, and the Corps of Engineers, as construction agent for the Air Force," said the House committee interim report. "The Corps of Engineers has come into agreement that testing would be done with a view of making more accurate determinations on the suitability and adaptability of asphaltic concrete in certain areas."

Seaway Project Criticized The Department of Agriculture has issued an analytical report that does some down-grading of the International St. Lawrence Seaway. Prepared for the Department by a University of Massachusetts professor, the report, among other things, says:

"Many assume that once the St. Lawrence River and inter-lake channel improvements now underway are completed, movements via the seaway will attract unlimited shipping. But the shipping season is no more than eight months long (mid April to mid December) . . . Furthermore, the Great Lakes-St. Lawrence route with channels of 27 ft. and many locks and its tolls will be comparatively shallow, a slow and expensive route for ocean-going ships."

Sand, gravel Percentage Depletion The bill that would allow a deduction to taxpayers for percentage depletion on income from sand and gravel dredged from the beds of navigable waters, under permit of the Federal government, will be alive when Congress reconvenes in January.

When Congress adjourned after the longest session since World War II, the House-passed bill was pending before the Senate Finance Committee. The measure would amend the Internal Revenue Code of 1954 to provide the same five percent depletion allowance currently available to those who

own land from which sand and gravel is extracted. The Internal Revenue Service now disallows the deduction on the grounds the taxpayers do not have an economic interest in the deposit in navigable streams. The measure would remove the discrimination against them.

In face of the fact that there was a tax cut in 1954 when the Republicans controlled Congress, Federal tax rates are still only slightly below the peak rates of World War II. There are more than 2,500 tax reduction bills of various kinds pending before the House Ways and Means Committee.

Still a Shortage

The last complete nationwide survey by the Bureau of Public Roads on the shortage of engineers by the various highway departments was made last year. However, the Bureau says a spot check indicates there is still a marked shortage, and there have been no material changes. The 1956 survey showed 20,600 engineers. Engineering assistants and technicians totaled 25,900.

Tax Cut?

A race is already underway between Democrats and Republicans to get chalked up for their side credits pertaining to proposed tax cuts in 1958, national election year. Chairman Jere Green of the House Ways and Means Committee announced that hearings will begin January 7.

The last two times there has been a major tax reduction Republicans have been in control of Congress. Therefore, the Democrats, now in control of Congress, are anxious to get credit at the coming session. A budget surplus in fiscal 1958 is expected to make the reductions possible. Just what form the proposed reductions will take will be determined. However, there will be a broad study of the federal tax system.

Mineral Resources Bureau?

The House Government Operations Committee is expected to conduct hearings after Congress returns in January on a bill that would create a United States Department of Mineral Resources.

The measure was introduced by Rep. Walter S. Baring, Democrat of Nevada, member of the House Interior and Insular Affairs Committee. Whether the Committee will consider the Baring proposal or draft its own will be determined.

By terms of the pending proposal there would be a Secretary of Mineral Resources, an under secretary and four assistant secretaries, each of whom shall be appointed by the President. Their appointment would require Senate confirmation.

Within the Department there would be a separate division to handle matters relating to each of the following: (1) coal, (2) petroleum and gas, (3) metallic minerals and nonmetallic minerals and (4) mineral patents and leases.

A two-year study of mineral problems and the outline of a long-range program was completed earlier in the year by the Department of Interior at the direction of President Eisenhower. The hazards of minerals exploration are becoming greater. Therefore, the Administration believes the Federal government must cooperate more closely with private enterprise.

Labor Probe

One of the major accomplishments of the first session of the 85th Congress was the hard-hitting inquiry of the McClellan committee into the labor rackets.

Senator Irving M. Ives, vice chairman of the committee, said he is certain the hearings will be conducted throughout most of 1958, and there is the possibility the hearings may last five years.

The general feeling on Capitol Hill is that only the surface of the rackets in labor unions, carried on by "big time labor bosses," has been penetrated. The hearings may result in Congress passing laws that would place the labor unions under the Sherman Anti-Trust Act.

Construction Item

A measure of interest to the construction and allied industries is the proposed substitute program for the stalled lease-purchase program. Congress approved in 1954, a so-called lease-purchase program to replace new post offices and other Federal buildings.

Under the plan private capital was invited to finance the buildings. Upon completion the Government would lease the buildings and retire the debt like paying rent. The interest rate was fixed at four percent. The program floundered so long it became a flop and Congress let it die in July. Only the $2 million post office at Rock Island, Ill., has been completed under the program.

As a substitute there is pending before the House Public Works Committee a substitute proposal that would authorize $1.5 billion in direct funds for 141 General Services Administration and Post Office Department buildings.

END



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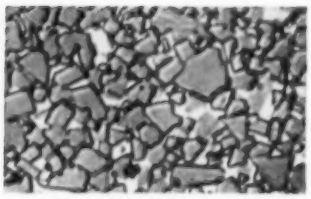
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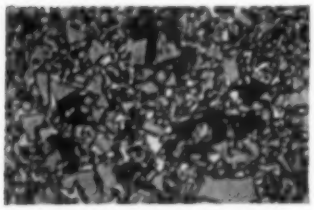
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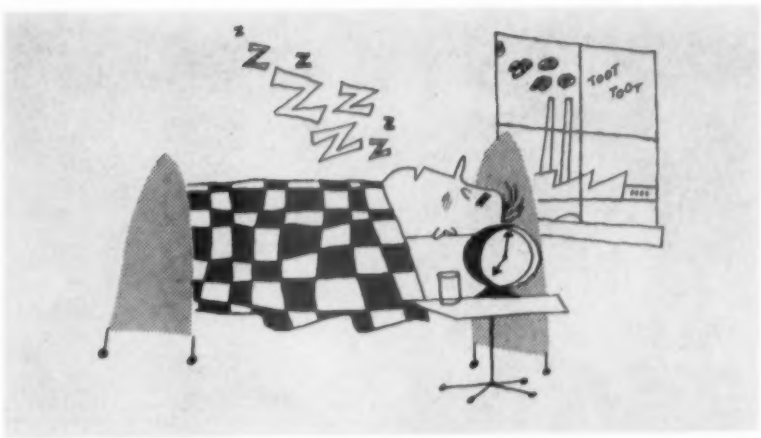
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DSS-78

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How would you decide?

A roundup of actual day-to-day in-plant problems and how they were handled by management men



When is absenteeism not a cause for discharging an employe?

What Happened:

HENRY BROWN TURNED UP FOR WORK on Monday an hour and a half late. He was sent home because of his tardiness. The next two days he was absent. He asked another worker to say he was ill and wouldn't be in. When he came back he was fired for being absent for three consecutive days without satisfactory excuse. Henry insisted that he certainly did have an excuse. But the company claimed:

1. Henry was not only late on Monday. He was unfit for work because he'd been drinking.
2. We don't believe he was ill the following two days. His wife called us to ask if we knew where he was. She said he wasn't home.
3. Even if he were sick, he didn't report it properly so as to excuse his two-day absence.
   He obviously didn't impress on the other worker the importance of actually reporting him ill. The man didn't say anything to anybody until the afternoon of the third day, when inquiries were made about Henry's absence.
4. The contract clearly says that if a worker is absent for three consecutive days without satisfactory excuse, that's cause for discharge.

Henry protested indignantly:

1. That was the first time I'd ever been absent or late. And my work has been good. Doesn't a record like that count?
2. I wasn't drunk the day I was late. Maybe I'd had a few beers the day before, but not a drop that morning. I was late because I'd overslept.
3. I did ask that guy to be sure and report me sick. It's not my fault if he didn't.

Was the worker:
Right? ☐ **Wrong?** ☐

What Arbitrator Paul Hebert ruled:

"I find that there was just cause for disciplinary action and that the conduct of the employe was of a character to subject him to serious penalty. But discharge was too severe and unduly harsh for the following reasons: It is uncontraverted that the employe's work record was good. He had no previous record of absenteeism. There has been no showing that the employer was seriously inconvenienced or seriously damaged in its operations by the absences here involved. The evidence does not establish clearly that he was drunk or that he was not in a physical condition to work. Any doubt in the evidence as to his condition should be resolved in favor of the employe, especially as the management did not specifically assign drunkenness as the reason for sending him home. I feel, however, that as this was a first offense and as he was a good employe, an extended disciplinary lay-off would have impressed upon him his duty to be prompt and regular in his attendance and would have adequately met the needs for maintaining discipline among the employes. The grievance is sustained to the extent of directing reinstatement of the employe without back pay."

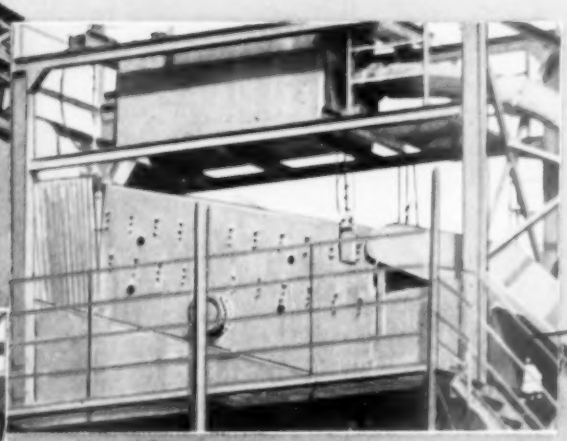
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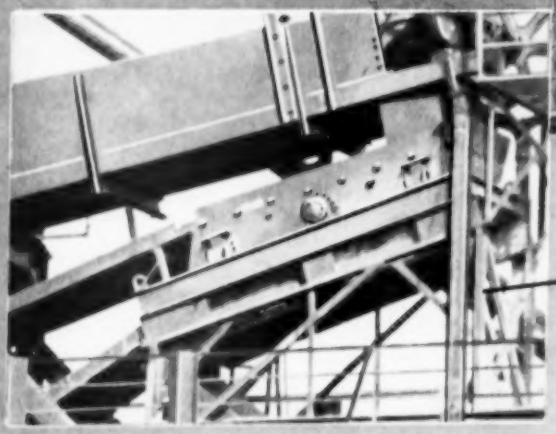
Each incident given in this department is taken from a true-life grievance which went to arbitration. Names of some principals involved have been changed for obvious reasons. Readers who want the source of any of these cases may write to *Rock Products*.

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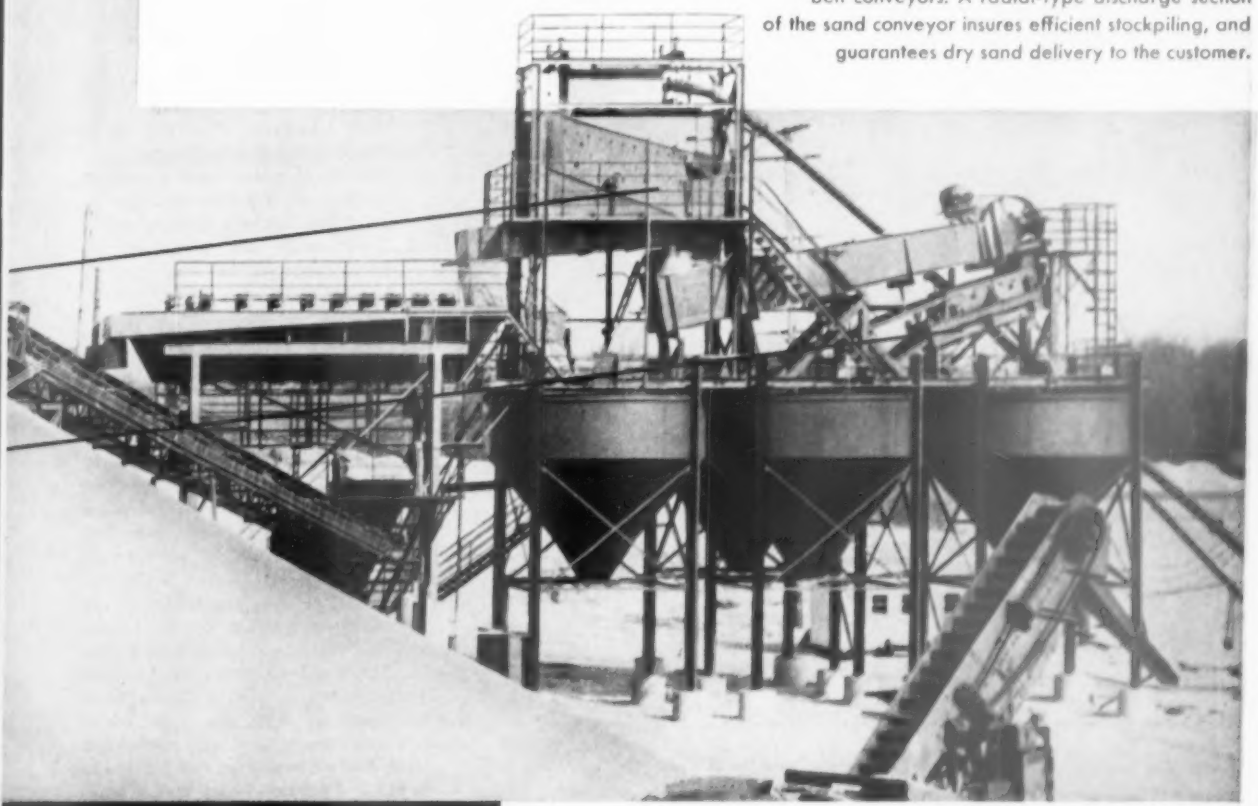
In the final phase of processing aggregates discharge from the logwasher onto a 4' x 8' Model BG triple deck unit. Here the final rinsing and sizing takes place. The top deck, 1⅜" sq. opening, splits the aggregate into two concrete specifications. The second deck openings are used to assist in making any unusual gradations, but primarily to lighten the load on the third deck where small opening screen cloth eliminates the broken soft stone, coal, and slate degradation. • Write today for Catalogs #531 and #571. • SIMPLICITY equipment can increase production in your plant.

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continued from page 23

Do you need union's consent to farm out work employes usually do?



What Happened:

THE COMPANY had a group of workers who usually did any repair, alteration and construction work on the plant—though the contract didn't require it. There was an unwritten understanding that the company would let the union know before it contracted out any such work. When one big job was farmed out, the union objected:

1. The company's past practice acknowledges that the workers have the right to do all such work.
2. The company violated its understanding with us by not letting us know that it was going to let the work out.
3. The men who should have done the work were deprived of pay that was rightfully theirs.

The company answered:

1. Past practice does not have the same effect as a written agreement and is not binding upon future practice.
2. The understanding merely required us to notify a union official orally, and this was done. It has never called for union consent before subcontracting.
3. The workers can hardly be said to have lost any pay. At the time we let the work out they were working a six-day (and in some instances a seven-day) week.

Was the company:
Right? ☐ **Wrong?** ☐

What an Arbitration Board Ruled:

"Can an agreement or practice to notify the union before subcontracting be held to have the same legal effect as a clearly spelled-out clause in the master agreement, in which management plainly agrees not to subcontract unless the union is notified and agrees to such subcontracting? We do not think so. The reverse is the universal or general rule. So, assuming good faith, management suffers no limitation on the inherent and important right to subcontract, save only with respect to specific jobs management decides that it will, in the particular instance, permit the workers in its plant to perform. The grievance and the request for monetary relief must be denied in its entirety, and the position of the company sustained."



When can you require employes to work overtime?

What Happened:

THE SUPERINTENDENT ANNOUNCED he would need 20 men to work the next Sunday, not a regular workday. Of the men assigned to the overtime job, 14 said they wouldn't be available. The super said that the Sunday schedule was "an order" and they'd better turn up or else. The 14 men didn't show up.

They got a five-day layoff. "You can't do that to us," the men said, and put up the following reasons:

1. The contract says employes will be offered the opportunity to work overtime.
   You don't have to take something that's offered to you.
2. It also says to tell your foreman when you won't be available for overtime. That means you got a choice.
3. Many workers have refused to work overtime before, and none of them ever got punished for it.

The superintendent answered:

1. The business requires some weekend work and we have to know ahead of time that we'll have enough men on hand.
2. That Sunday work was a definite assignment. We have the right to discipline workers who refuse.
3. These men are a bunch of trouble-makers, anyway.

Was the superintendent:
Right? ☐ **Wrong?** ☐

What An Arbitration Board Ruled:

"This board finds from a careful reading of the contract that the company has contracted away its right to schedule mandatory overtime. The words 'opportunity to work overtime shall be offered to the employes' certainly puts the working of overtime on a voluntary basis. This is borne out further in ' . . . any employe may advise his supervisor that he will be unavailable for trouble call during time off.' There are no conditions attached to this sentence. All the employes of this company must do is to advise their supervisor they are unavailable. "The evidence showed that 94 employes had refused overtime on many occasions and were never disciplined. This leads the board to believe that it was the intention of the company and the union to agree that overtime assignments would not be mandatory. The company cannot force the employes to perform weekend work by calling it a work assignment. The grievances are sustained."

END



A **Buell Cyclones** offer exclusive Shave-off which harnesses double-eddy currents and puts them to work, large diameter design which eliminates bridging and clogging.

B **Buell "SF" Electric Precipitator** delivers extra collection efficiency through use of unique high emission, selftensioning Spiralectrodes and exclusive Continuous Cycle Rapping.

C **Buell Combination Cyclone-Precipitator Systems** combine exclusive Buell features for extra efficiency where extremely high performance standards must be met.

Which is the best dust collection system?

Five factors influence the choice of a dust collection system: dust characteristics, gas characteristics, efficiency required, installation and operation costs, and limitations of space or draft loss. In every installation, exclusive Buell features provide *extra efficiency*. A booklet, "The Collection and Recovery of Industrial Dusts", provides valuable, specific details. Just write Dept. 17-J, Buell Engineering Company, Inc., 70 Pine Street, New York 5, New York



buell®

Experts at delivering Extra Efficiency in **DUST COLLECTION SYSTEMS**

Enter 1539 on Reader Card

New Deep Hole Combination Drills

10 FEET OF 3" HOLE EVERY 7 MINUTES

in Hard Trap Rock!

Drill controls stay within easy reach for drilling top holes.



And using 10 foot sectional rods on 40 foot holes total elapsed drilling time was only 34 minutes! We've teamed-up the self-propelled G-800 Tracdril and the CP 4½-inch Reversible Deep Hole Drill to give you the best in mobility and drilling performance. You can inch the Tracdril into tight spots with ease. It takes tough terrain in stride without "bull work" and tows its own compressor up steep grades.

Tops in its class, the CP-450DR Deep Hole Drill hits hard, has powerful rotation that stands crowding. Cleans hole with jet air. With this Tracdril-mounted deep hole rig you can drill toe hole or top hole with equal ease. Ask your equipment dealer for details. *Chicago Pneumatic Tool Company, 8 East 44th St., New York 17, N. Y.*

Just move feed motor to rear of the drill carriage to start toe holes only 6" from bottom.



PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

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PEOPLE IN THE NEWS

Voss honored by A.S.T.M.

WALTER C. VOSS, professor emeritus, Massachusetts Institute of Technology, Cambridge, Mass., was given an Award of Merit recently by the American Society for Testing Materials in recognition of his work and contributions to the Society, especially in Committees C-7 on Lime and C-12 on Mortars for Unit Masonry.

J. O. Leonard promoted

J. O. LEONARD has been appointed assistant general superintendent of the Marble Cliff Quarries Co., Columbus, Ohio. He has been associated with the company since 1925, and has been superintendent of the Lewisburg plant since 1939. Chester Brown, foreman of the lime plant and a member of the firm since 1940, has been named to succeed Mr. Leonard as superintendent of the Lewisburg plant.

Assistant superintendent

CURTIS W. DOVE has been named assistant superintendent of the Northampton, Pa., plant of Dragon Cement Co., division of American-Marietta Co., New York, N.Y.

Aglite chairman

DAVID S. FISCHMAN, chairman of the board of Sayre & Fisher, Sayreville, N.J., has also been elected chairman of the board of the Aglite Corp. of America, a subsidiary.



Inland president retires

A. J. CAVIA has retired as president of the Inland Lime & Stone Co., Manistique, Mich., after 29 years of service. He will be succeeded by A. W. Heitman, vice president of operations. John W. Moffat, formerly superintendent, has been named to succeed Mr. Heitman in his former position.

Assistant research director

DR. ARNOLD J. HOIBERG has been appointed assistant research director of The Flintkote Co., East Rutherford, N.J., which is acquiring the Kosmos Portland Cement Co., Louisville, Ky. Formerly asphalt research director for the Lion Oil Co., El Dorado, Ark., Dr. Hoiberg received his Ph.D. degree in chemical engineering from the University of Wisconsin, Madison, Wis. As assistant research director, he will make his headquarters at the research laboratory in Whippany, N.J. R. H. Cubberley is research director.

Chief engineer

MARSHALL H. WINKLER has been appointed chief engineer of The Bessemer Limestone & Cement Co., Youngstown, Ohio. He succeeds Finn R. J. Darre who has resigned. Mr. Winkler was formerly superintendent of the cement plant and will be succeeded by Richard W. Sheets.

(Continued on page 32)

Penn-Dixie Co. appoints new sales managers



E. Carl Matheson



Donald L. Hensley

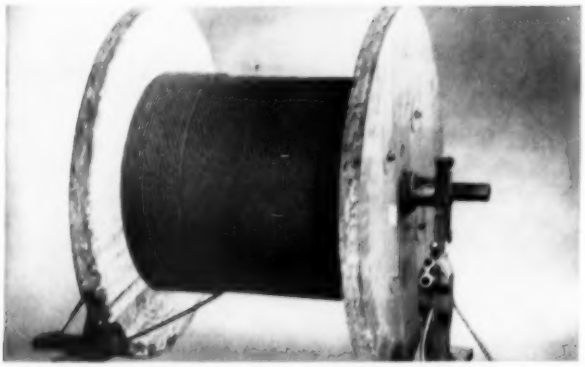
DONALD L. HENSLEY has been appointed general sales manager of Penn-Dixie Cement Corp., New York, N.Y., and E. Carl Matheson has been named assistant general sales manager. Robert L. Mitchell has been named to succeed Mr. Matheson as district sales manager for the metropolitan New York sales district.

Mr. Hensley became associated with the cement industry in 1939 and joined Penn-Dixie in a sales capacity in Boston in 1942. He was transferred to the New York sales office in 1946 where he was appointed district sales manager and then assistant general sales manager. He is a native of West Virginia and received a B.A. degree from the University of Pittsburgh.

Mr. Matheson started his career in the cement industry after graduating from Pennsylvania State College in 1928. He joined Penn-Dixie in 1937 as assistant district sales manager in Boston. He was named district sales manager in Rochester in 1939 and served in the same capacity in Boston and New York.

Mr. Mitchell joined the company in 1952 as sales representative in the Philadelphia district, and later transferred to Harrisburg, Pa.

Tuffy Wire Rope Tips



Here's the way to set up reel for unwinding

The stock reel should be set up on jacks, so the rope will come from the under side of the reel as shown in this picture.



This reel is set up right

Unwinding has started, and the reel is spinning faster than the rope is being pulled off. But because it's coming from the under side of the reel, the rope is simply loosening on the reel, with no damage.



This reel is set up wrong

The rope is coming from the top of the reel and forming loops as the reel over-runs. These loops are likely to form kinks and dog-legs, which can be ruinous to rope life.



Eight steps of correct SOCKETING

1. Securely seize and serve with soft wire ties before cutting, and have at least two additional seizings placed at a distance from the end equal to the length of the basket of the socket.

2. When the rope is properly seized, take off the end seizing. Cut the fiber center back to the seizing, as shown in Fig. 1 above. Untwist and broom out the wires. See Fig. 2.

3. Clean the wires for the distance they are to be inserted in the socket. Use benzine, naphtha or gasoline. Then dip the wires in commercial muriatic acid, to a depth not greater than ¾ of the cleaned length of wire. Keep them immersed for 30 seconds to 1 minute, or until the acid has thoroughly cleaned each wire. Be sure acid does not contact any other portion of the rope.



Follow these steps for PROPER SEIZING

Since practically all wire ropes today are preformed, we suggest that when cutting you put only one seizing on each side of the cut.

When cutting ordinary ropes, thoroughly seize (bind, serve or tie) so there will be no misplacement or relative movement of strands. For most ropes, other than preformed, *three* seizings should be used on each side of the cut. *Four* seizings on each side are required for a lang lay rope, or any rope having an independent wire rope core or a wire strand core. *Four* seizings are also needed for all 18x7 ropes, and all ropes larger than 1" diameter.

Tuffy Special Wire Ropes are tailored to special use. Ordering is easy:



Tuffy Scraper Rope

It's flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Moves more yardage per foot because it's specially built to take the beating of drum-crushing abuse.







Tuffy Dragline Rope

Constructed to give you maximum abrasive resistance with super flexibility. Rides smoothly on grooves, hugs the drum when casting for full load. Consistently dependable in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.





Watch your steps

when you unwind, seize, clip, socket and reeve wire rope



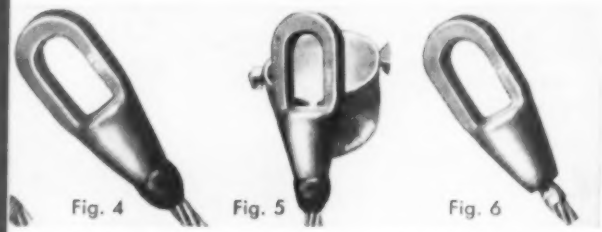


Fig. 4 Fig. 5 Fig. 6

4. Dip the wires in boiling water containing a small amount of soda, to neutralize the acid.

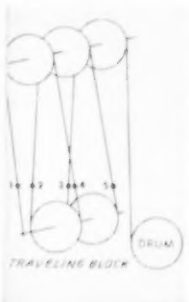
5. Place a temporary tie wire over the ends of the cleaned wire (see Fig. 3). Be careful not to get the cleaned wires greasy or oily.

6. Insert the rope end into bottom of socket. Remove temporary tie wire.

7. Holding the rope vertically in a vise, set the socket so that the wires are flush with top of the socket basket and seal the bottom with putty or clay (Fig. 4). Pour in among the wires about ½ teaspoon of sal ammoniac crystals.

8. Pour molten zinc into the basket to fill (Fig. 5). When zinc is solidified, remove seal. Socketing is complete as shown in Fig. 6.

REEVING



Reeving ropes through the sheaves multiplies the number of parts supporting the load. The lead line to the drum carries the weight of the load lifted, divided by the number of parts, plus the accumulation of friction on all sheaves.

Here's how to count the number of parts supporting the load. Draw an imaginary line across the parts of the rope supporting the load.

The efficiency of reeving systems ranging from one to eight parts is shown in charts which Union Wire Rope engineers make available to users.

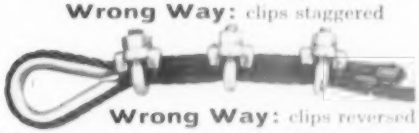
Attaching by CLIPPING



RIGHT WAY for greatest rope strength



Wrong Way: clips staggered



Wrong Way: clips reversed



The fitting you use on wire rope can handicap it or enable it to work at full efficiency. Fittings which derive holding power from crimping action are harmful to the rope.

Shown here is a clamp that has no wrong side—can be put on either way. It snugly saddles the rope, grips larger surface area in such a way that loads are carried almost solely by friction rather than by crimping action. Combined in its two parts is a thimble and the parts are interlocking to prevent collapse of the thimble and to eliminate all shear on the bolts.

Just say **Tuffy** give length and size, and forget complicated specifications.

Tuffy Slings and Hoist Lines

Here's the team that does a topflight job with every type of materials handling. **Tuffy Slings** are made of a patented, machine-braided fabric; stays extra flexible; can't be hurt seriously by knotting or kinking. **Tuffy Hoist Line** is a special construction of super flexibility and toughness.



Tuffy Dozer Rope

Constructed to give you longer service life with less downtime. 150' reels of ½" or 9/16" mounted on your dozers allow you to cut-off worn sections without wasting good rope. Put Tuffy Dozer Rope on the job and watch costs go down!



Ready Help in Your Wire Rope Problems . . .

ASK YOUR UNION DISTRIBUTOR

Whether your wire rope need is a scheduled replacement or emergency requirement, your Union distributor is ready with "right-now" service. He keeps complete warehouse stocks of Union standard constructions and the Tuffy special purpose ropes. And he's backed by immediate service from his nearby Union Wire Rope depot.

If it isn't rope you need, but advice on a wire rope problem, he's just as ready to help. Just say the word!

If you don't know him already, see your classified telephone directory, under Wire Ropes or Slings.

union Wire Rope **corp.**

2156 Manchester Avenue, Kansas City 26, Mo.

Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand

Enter 1545 on Reader Card

PEOPLE IN THE NEWS

(Continued from page 29)



Public relations director

ARTHUR M. GRIFFIN has been appointed director of community and employe relations for New York Trap Rock Corp., New York, N.Y., according to an announcement by Wilson P. Foss, III, president. Mr. Griffin was formerly aviation promotion supervisor for the Port of New York Authority. He received a Bachelor of Arts degree in history and economics at Tufts College, Medford, Mass., where he was also awarded a Master of Arts degree in education. He studied law for two years at Boston University, and received his doctorate in education at the University of Denver.

PCA representatives

D. C. OLMSTEAD has been appointed field representative in northwestern Ohio for the Portland Cement Association, Chicago, Ill. He succeeds E. F. Boggs, who has been named field representative in southeastern Ohio. Formerly city engineer at Bryan, Ohio, Mr. Olmstead received his engineering degree from Tri-State College, Angola, Ind.

Elected vice president

A. J. WATT, general merchandise manager, United States Gypsum Co., Chicago, Ill., has been elected a vice president of the company.

Ideal promotions

ROBERT E. MARSH, formerly assistant plant manager at Portland, Colo., plant of Ideal Cement Co., Denver, Colo., has been promoted to plant manager at Superior, Neb., succeeding F. Grayson Meyers, who has retired. Warren E. Brown, assistant plant manager at Baton Rouge, La., has been appointed plant manager at San Juan Bautista, Calif., to succeed L. N. Bryant who has resigned. Millard E. Ball, formerly master mechanic at Okay, Ark., has been promoted to plant manager, succeeding Claude McMillan who has been named assistant to the chief engineer at Denver. Ronald E. Wallis, formerly mill foreman at Gold Hill, Ore., has been appointed superintendent of the Sacramento Terminal. Donald F. Carlson, formerly assistant plant manager at Spokane, Wash., has been made plant manager at Trident, Mont., succeeding Harold Lamont who has resigned.

Research director retires

GEORGE C. WILSNACK has retired as director of research for Ideal Cement Co., Denver, Colo., and T. W. Rosebaugh, vice president, has assumed direction of business research, the central and research laboratory, and exploration. John W. Hand continues as director of business research and John A. Wolf as chief geologist. Kenneth E. Palmer is manager of the central and research laboratory.

Kaiser Gypsum promotions

WARREN B. JOHNSON has been named product manager for insulated siding products and William J. Marshall has been appointed sales service representative for the insulating board division of Kaiser Gypsum Co., Inc., Oakland, Calif. Mr. Johnson, who has had 10 years of sales management and application experience in the siding and construction fields, will supervise the company's entire insulated siding market area. Mr. Marshall for the past five years has been technical director of the Insulation Board Institute, Chicago, Ill.

On chamber of commerce committee

CRIS DOBBINS, president of Ideal Cement Co., Denver, Colo., has been reappointed to the Manufacture and Industrial Development Committee, Chamber of Commerce of the United States.

E. PHIL GEMMER, president, Texas Construction Material Co., Houston, Texas, and Frank E. McCaslin, president, Oregon Portland Cement Co., Portland, Ore., have been reappointed to represent the minerals and metals industries on the Natural Resources Committee of the Chamber of Commerce of the United States. David L. Francis, president, Princess Elkhorn Coal Co., Huntington, W. Va., is chairman of the committee.

Executive vice president

RICHARD P. IMMEL, vice president, has been elected executive vice president and general manager of the American Limestone Co., Knoxville, Tenn., wholly owned subsidiary of the American Zinc, Lead and Smelting Co., St. Louis, Mo. Richard E. Sansom, manager, has been named vice president and manager.

A.A.S.H.O. chairman



CARLOS A. WEBER, chief engineer of the Michigan State Highway Department, Lansing, Mich., has been appointed chairman of the design committee of the American Association of State Highway Officials, according to an announcement by A. E. Johnson, executive secretary of the Association. Mr. Weber has been a member of the committee on planning and design policies for the midwest region for several years. As chairman of the design committee, he is automatically a member of the advisory committee on the A.A.S.H.O. Test road. Mr. Weber has been with the highway department for 37 years.

Publications manager

ROBERTSON SILLARS has been appointed manager of the publications bureau of the Portland Cement Association, Chicago, Ill. He succeeds J. L. Schneider who will devote full time to his duties as assistant secretary of the Association. Mr. Sillars joined the PCA in April 1957 as assistant to the manager, publications bureau, after six years as editor of publications of the Adult Education Association of the U.S.A. He holds the degree of Doctor of Education from Teachers' College, Columbia University, New York, N.Y.

(Continued on page 39)

NEW MACK

heavy-duty four- and six-wheel dumpers

15- to 34-ton capacity



✻ LARGEST SELECTION OF HEAVY DUMPERS

Mack offers you the most complete line of dumpers for mining, quarrying, road building, construction. From heavy-duty 170 horsepower, four-wheel dumpers with 15-ton capacities to super-duty 400-horsepower, six-wheel dumpers with 34-ton capacities, Mack provides the economy and performance that can mean bigger hauling profits for you.

✻ CHOICE OF ENGINES

Mack offers you a choice of engines . . . Cummins diesels in the 300- and 400-horsepower class . . . or Mack Thermodyne and Cummins diesels in the 170 to 205 horsepower class. No need to alter existing maintenance facilities to handle new engine makes . . . you get the truck you want with the engine you want.

✻ OUTSTANDING PERFORMANCE

When you buy Macks, you know that you are getting top performance, outstanding economy, maximum dependability—qualities that have made Mack the acknowledged heavy-duty truck leader in the industry. Moreover, Mack dumpers are planned for accessibility throughout . . . engines are easily reached, no place in the suspension ever needs adjustment—these and many more Mack features reduce maintenance costs and make routine servicing easier. And in Macks, you get the finest transmissions and axles available . . . made by Mack and found only in Macks!

✻ COMPETITIVELY PRICED

Mack off-highway dumpers are priced right in line with competitive makes. Yet, with Macks, you get those "extras" that mean more payloads at lower hauling costs . . . cabs engineered for maximum driver efficiency . . . specially designed components with extensive use of heat-treated alloy steels . . . single-unit all-welded frames that can take plenty of hard knocks . . . outstanding performance and economy from a complete line of engines.

✻ STOCK DELIVERY

All 15 and 22½-ton Mack dumpers are available from stock. The units you want with the engines and transmissions you want can be supplied upon gratifyingly short notice. There are no delays, no production schedules for you to worry about. For more information on delivery, contact your local Mack Dealer or Representative.

MACK LRX
capacity: 15 tons



This four-wheel, off-highway dumper combines a big 15-ton rated capacity with outstanding maneuverability. Either a Mack or Cummins Diesel engine—along with heavy-duty clutch, 10-speed transmission, and Mack's Planidrive rear axle assembly—gives plenty of pulling power for long hauls on steep grades. Rugged, unified frame assembly, powerful air brakes, and comfortable cab with driver's position offset to the left assure the top performance and efficiency that have made the LRX a highly popular dumper in mine, quarry, and road-building operations.

CONDENSED SPECIFICATIONS

STANDARD EQUIPMENT

DIMENSIONS:	14.00-24 Rear Tire
Wheel Base	13' 4"
Platform	9' 1"
Overall Width	9' 11"
Overall Height	10' 8"
Overall Height (Body Raised)	18' 8"
Overall Length	24' 7½"
Turning Circle Diam. (To outside edge of tire)	60'
Weight (Chassis, Body & Hoist)	33,000 lbs.
Payload	30,000 lbs.

ENGINE (Diesel):

Model	END 673
Make	Mack, Thermodyne
Type	Naturally aspirated
Number of cylinders	Six
Bore and stroke	4⅛" x 6"
Piston displacement, cu. in.	672
Brake horsepower @ 2100 r.p.m. (gov.)	170
Max. torque @ 1200 r.p.m.	480 lb.-ft.

CLUTCH (Available with END 673 only):

Type	Mack single plate, dry
Area of engagement, sq. in.	253

ELECTRICAL SYSTEM:
Voltage and capacity 12 V., 50 Amp. (24 V., Starting)

TRANSMISSION:

Type	Mack selective, constant mesh
No. of speeds: forward	Ten
reverse	Two

FRONT AXLE:
Make Mack Reversed Elliott, drop forged I beam

REAR AXLE:

Make	Mack Planidrive
Drive	Dual Reduction
Final Drive (3rd reduction)	Planetary gear train within wheel hubs
Total Ratio	16.5

BRAKES (Air):

Compressor	Tu-Flo
Type	Internal expanding
Front, size	17¼" x 5" x ¼"
Rear, size	20" x 7" x ¼"
Hand, size	12" x 5" x ⅛", Bendix

FRAME:

Side members, size	12½" x 6¼" x ½", wide flange I-beam, rolled section
Section modulus	60.7 (per rail)

SPRINGS:

Front, type	Semi-elliptic
Rear, suspension	Semi-rigid, axle mounted to frame

WHEELS:
Type Cast, spoke

STEERING GEAR:
Control Manual

TIRES:	Front	Rear
Size	12.00-24 (16P) Rib	14.00-24 (20P) Lug

CAB:
Type: Heavy-duty off-highway, closed, all-steel welded. Offset 10¼" to left of chassis centerline provides clear vision for driver to rear.

CHASSIS EQUIPMENT: Front and rear tow pins; air horn on cab roof; cab entrance steps and platforms; rear view mirror, left side; channel type front bumper; dual windshield wipers; vertical exhaust; stop-tail light; rim lug wrench and handle.

HOIST:
Make & model Heil
Type Twin, double-acting, 8" diameter, hydraulic cylinders with 24" stroke, 70° dumping angle.

BODY:

Type	Rock, with scoop end
Make	Heil
Capacity, line of plate	9.8 cu. yds. struck

Construction: ¼" steel plate shell bottom; ⅜" sides and header; ½" wear and side bevel plates; ¼" canopy. 3" x 5 lb. channels between floor plates either side of a 1⅝" edge grain hardwood middle section filler.

OPTIONAL EQUIPMENT

ENGINE (Diesel):

Model	NHB	ENDT 673
Make	Cummins	Mack, Thermodyne
Type	Naturally aspirated	Turbocharged
Number of cylinders	Six	Six
Bore and stroke	5½" x 6"	4⅛" x 6"
Piston displacement cu. in.	743	672
Brake horsepower @ 2100 r.p.m. (gov.)	200	205
Max. torque @ r.p.m. pound-feet	1200 537	1400-1600 560

CLUTCH (Included with NHB and ENDT 673):

Type	Mack two-plate, dry
Area of engagement, sq. in.	416

TIRES:	Front	Rear
Size	13.00-24 (18P) Rib	16.00-25 (20P) Lug

BODY:

Type	Flared Quarry
Make	Heil
Capacity, line of plate	11 cu. yds. struck

Construction: ¼" steel plate shell bottom; ½" sides; ½" header, slope; ⅜" header, vertical; ½" wear plate; ¼" canopy. 3" x 5 lb. channels between floor plates either side of a 1⅝" edge grain hardwood middle section filler.

Body Equipment: (for std. and opt. bodies): (9) ¼" x 6" alloy wear bars; rock ejectors; ½" alloy wear plate; horizontal bolsters (3 per side); canopy, loose for export shipment. (for std. body only): exhaust heating connections; welded on side boards.

CHASSIS EQUIPMENT: Automatic radiator shutters; Wagner "BB" (24 hour chart 0-3500 r.p.m.) tachograph in place of standard Tachometer; speedometer; hubodometer; left front wheel; Vickers power steering; front wheel limiting valve; hand control valve to operate rear service brakes; low air pressure indicator; Wig-Wag type; screen type radiator guard; 25,000 B.T.U. hot water cab heater with defrosters; spare rim; hydraulic jack, 20-ton; air starting; cold starting equipment; insulating dash mat.

MACK — FIRST

MACK LVX
capacity: 22½ tons



This four-wheel dumper with its 22½-ton rated capacity provides maximum payloads at minimum unit cost. Equipped with either a 300 or 335-horsepower engine, over-gear transmission with two-speed compound or torque converter, and Mack's exclusive Planidrive rear axle assembly, it is powered to give top performance under the most punishing operating conditions. All-welded, single-unit, alloy-steel frame gives LVX's stamina and rugged durability. Elbow steering column, hydraulic steering booster, two-plate air-assisted clutch, and job-engineered cab with extreme left driver position assure maximum operating efficiency. From top to bottom, this big Mack gives you the "extras" that mean minimum hauling costs.

CONDENSED SPECIFICATIONS

STANDARD EQUIPMENT

DIMENSIONS:

Wheelbase	14' 2"
Platform	9' 11"
Overall Width	11' 2"
Overall Height	11' 4⅝"
Overall Length	26' 7½"
Overall Height (Body Raised)	21'
Turning Circle Diam. (To outside edge of tire)	62'
Weight (chassis, body & hoist)	40,800 lbs.
Payload	45,000 lbs.

ENGINE (Diesel):

Model	NHRBIS
Make	Cummins
Type	Supercharged
Number of cylinders	Six
Bore and stroke	5½" x 6"
Piston displacement, cu. in.	743
Brake horsepower @ 2100 r.p.m. (gov.)	300
Max. torque @ 1500 r.p.m.	818 lb. ft.

CLUTCH:

Type	Mack Two-plate, dry
Area of engagement, sq. in.	416
Actuation	Manual, with air assist

ELECTRICAL SYSTEM:
Voltage and capacity: 12 V., 50 Amp. (24 V. Starting)

TRANSMISSION:

Type	Mack selective, constant mesh
No. of speeds, forward	Eight
reverse	Two

FRONT AXLE:
Type: Mack Reversed Elliott, drop forged I-beam

REAR AXLE:

Make	Mack Planidrive
Drive	Dual Reduction, spiral bevel
Final drive (3rd reduction)	Planetary gear train within wheel hubs
Total Ratio	17.66

BRAKES (Air):

Compressor	Tu-Flo
Type	Internal expanding
Front, size	17¼" x 5" x ¾"
Rear, size	18" x 10" x ¾"
Hand, size	12" x 5" x ⅜"

FRAME:

Type	I-beam, wide flange
Material	Alloy steel
Side-members, size	13⅛" x 8" x ⅝" (Fabricated)
Section modulus	74.8 per rail

SPRINGS:

Front	
Type	Semi-elliptic
Suspension	Mack rubber shock insulators
Rear	
Type	Progressive rate, semi-elliptic
Suspension	Cam face slipper ends with radius rods

TIRES:

	Front	Rear
Size	14.00-24 (16P) Rib	18.00-25 (24P) Lug

WHEELS:
Type: Cast, spoke

STEERING GEAR:
Power steering assist: Vickers hydraulic booster

CAB:
Type: Heavy duty off-highway, closed, all steel, welded. Cab offset 10¼" to left of chassis centerline provides clear vision for driver to rear.

CHASSIS EQUIPMENT: Screen type radiator guard; front and rear tow pins; air horn on cab roof; dual windshield wipers; two air reservoirs; rear view mirror, left side; Mack power take-off and control (not available with Allison Transmission); door in hood side for access to oil filler and dip stick; exhaust through hood with inline muffler; channel type front bumper; stop-tail light; rim lug wrench and handle.

HOIST:
Type: Twin, double-acting, outboard mounted, three section telescopic cylinder assembly directly connected to body and chassis through a universal joint arrangement providing a 70° dumping angle.

BODY:

Type	Rock, with scoop end
Make	Heil
Capacity, line of plate	14.8 cu. yds., struck

Construction: ¼" steel plate shell bottom; ¾" sides and header; ½" wear and side bevel plates; ¼" canopy; 3" x 7.1 lb. channels between floor plates either side of a 2" edge grain hardwood middle section filler.

OPTIONAL EQUIPMENT

ENGINE:

Model	NRTO
Make & type	Cummins, turbocharged
Number of cylinders	Six
Bore and stroke	5½" x 6"
Piston displacement, cu. in.	743
Brake H.P. @ 2100 r.p.m. (gov.)	335
Max. torque @ 1500 r.p.m.	900 lb. ft.

TRANSMISSIONS:
Westinghouse Converter and Mack 4-Speed Transmission. Clutch, 2-plate, 17", air actuated.
Allison Torqmatic Converter and Allison Transmission. Twin Disc Converter and Mack 4-Speed Transmission.

FRONT AXLE: Special Heavy-duty, Reversed Elliott Drop Forged I-beam.

TIRES:

	Front
Size	14.00-24 (20P) Rib

BODY:

Type	Flared Quarry
Make	Heil
Capacity, line of plate	15.2 cu. yds., struck

Construction: ¼" steel plate shell bottom, ½" sides, ¾" header, ½" wear and side bevel plates, ¼" canopy, 3" x 7.1 lb. channels between floor plates either side of a 2" edge grain hardwood middle section filler.

Body Equipment: (for std. and opt. bodies): (9) ¾" x 6" alloy wear bars; rock ejectors; horizontal bolsters (3 per side); canopy toe board; rock guards over tires; canopy, loose for export shipment (for std. body); welded-on side boards; exhaust heating connections.

CHASSIS EQUIPMENT: Air starting, Ingersoll-Rand 9HP; Tachograph, Wagner "BB" (24 hour chart 0-3500 r.p.m.) in place of standard Tachometer; Wig-Wag low air pressure indicator; hand control valve to operate rear service brakes; front wheel brake limiting valve; 75,000 B.T.U. hot water cab heater with defrosters; windshield fan mounted on windshield header; hubodometer; engine chrome cylinder liners and stellite inlet valve seats; insulating dash mat; fender to bumper treads; air-operated radiator shutter; air-operated Thermo-controlled radiator fan hub; speedometer; back-up light; hydraulic jack, 30-ton; spare rims.

NAME FOR TRUCKS

MACK LRSW

capacity: 30 tons



Powered by either a 300 or 335-horsepower engine, this 30-ton, six-wheel dumper has what it takes for off-highway operation in mines, quarries and earth-moving projects. Smooth application of power to its balanced, four-wheel drive bogie is obtained by an air-assisted clutch and overgear transmission with two-speed compound or torque converter. Convenient location of controls, angle steering column, hydraulic steering booster, and extreme left driver position give easy and efficient handling. Best materials, precision manufacture, and specially engineered components make the LRSW capable of withstanding the toughest 'round-the-clock hauling.

CONDENSED SPECIFICATIONS

STANDARD EQUIPMENT

DIMENSIONS:

Wheelbase	16' 10"
Platform	14' 11½"
Overall Width	11' 2⅛"
Overall Height	11' 6½"
Overall Length	29' 2⅛"
Overall Height (Body Raised)	24' 10"
Turning Circle Diam. (To outside edge of tire)	78'
Weight (chassis, body & hoist)	60,000 lbs.
Payload	60,000 lbs.

ENGINE (Diesel):

Model	NHRBIS
Make	Cummins
Type	Supercharged
Number of cylinders	6
Bore and stroke	5½" x 6"
Piston displacement, cu. in.	743
Brake horsepower (@ 2100 r.p.m. (gov.)	300
Max. torque (@ 1500 r.p.m.	818 lb. ft.

CLUTCH:

Type	Mack two-plate, dry
Area of engagement, sq. in.	416
Actuation	Manual, with air assist

ELECTRICAL SYSTEM:

Voltage and capacity	12 V., 50 Amp. with 24 V. starting

TRANSMISSION:

Type	Mack two-lever, Duplex
No. of speeds, forward	Eight
reverse	Two

FRONT AXLE:

Type	Mack Reversed-Elliott, drop-forged I-beam

BOGIE:

Make	Mack Planidrive
Final drive, type	Four-wheel, planetary
Inter-axle differential, type	Mack concentric cam and plunger Power Divider
Carriers	Mack Dual Reduction
Total Ratio	18.18

BRAKES:

Type and actuation	Internal expanding, inclosed, air
Front, size	17¼" x 5" x ¾"
Rear, size	20" x 7" x ¾"
Hand, size	12" x 5" x ⅝"

FRAME:

Type	I-beam, wide flange
Material	Alloy steel
Side members, size	13⅜" x 8" with ⅝" web and top flange, ⅞" bottom flange
Section modulus	84.5 per rail

SPRINGS:

Type, front	Semi-elliptic
rear	Semi-elliptic, inverted
Suspension, Mack	Rubber Shock Insulators

SHOCK ABSORBERS, FRONT:

Type	Houdaille, hydraulic

TIRES (Lug):

	Front	Rear
Size	14.00-24 (20P)	16.00-25 (20P)

WHEELS: Cast, spoke

STEERING GEAR:

Power steering assist	Vickers hydraulic booster

CAB:

Type: Heavy-duty off-highway, closed, all-steel, welded. Offset 10¾" to left of chassis center-line provides clear vision for driver to rear.

CHASSIS EQUIPMENT: Hubodometer; screen-type radiator guard; front and rear tow pins; air horn; rear view mirror, left side; exhaust through hood with in-line muffler; channel type front bumper; door in hood side for access to oil filler and dip stick; insulating dash mat; wig-wag low air pressure indicator; windshield wipers; stop and tail light; back up light; rim lug wrench and handle; automatic radiator shutters.

HOIST:

Make	Heil

Type: Twin double-acting, 10" diameter hydraulic cylinders with 40" stroke, 70° dumping angle with power return.

BODY:

Make and type	Heil, Rock-scoop end
Capacity, line of plate	21 cu. yds.

Construction: ¼" steel plate shell bottom; ⅛" sides and header; ¾" slope section; ¾" alloy wear and side bevel plates; ⅛" canopy; 3" x 7.1 lb. channels between floor plates either side of a 2" edge-grain hardwood middle section filler.

OPTIONAL EQUIPMENT

ENGINE:

Make and model	Cummins, NRTO
Number of cylinders	Six
Bore and stroke	5½" x 6"
Piston Displacement cu. in.	743
Brake horsepower (@ 2100 r.p.m. (gov.)	335
Max. torque (@ 1500 r.p.m.	900 lb.-ft.
Turbocharger	Turbine, exhaust driven

TRANSMISSIONS:

Westinghouse Converter and Mack 4-Speed Transmission. Clutch—2-plate, 17", air actuated.
Allison Torqmatic Converter and Allison Transmission.

WHEELS, TIRES:

Front & rear	
Wheels, type	Cast spoke
Tires, size	16.00-25
Ply rating, front	20 or 24
rear	24

BODY EQUIPMENT: (9) ¾" x 6" alloy wear bars; 1" alloy wear plate; rock ejectors; horizontal bolsters (4 per side); twin body prop; rock guards over tires; exhaust heating connections; canopy, loose (for export shipment).

CHASSIS EQUIPMENT: Air starting, Ingersoll-Rand 9HP; chrome cylinder liners and stellite inlet valve seats; air operated Thermo-controlled radiator fan hub; Tachograph, Wagner model "BB" (24 hour chart 0-3500 RPM) in place of standard Tachometer; speedometer; front wheel brake limiting valve; alcohol vaporizer; cab insulated; exhaust outlet under cab suitable for attachment to body for body heating; 25,000 B.T.U. hot water cab heater with defrosters; solex glass for windshield; windshield fan mounted on windshield header; fender to bumper steel treads; two stop-tail lights; 20-ton hydraulic jack; spare rim.

MACK — FIRST

MACK LRVSW

capacity: 34 tons



The 34-ton rated capacity of this super-payload, six-wheel dumper assures minimum haulage costs for the big earth-moving jobs. Equipped with a 400-horsepower engine, four-speed overgear transmission, hydraulic torque converter or two-speed compound, and a balanced, four-wheel drive bogie, LRVSW's can negotiate severe grades fully loaded. Maneuverability and ease of handling are facilitated by such features as a hydraulic steering booster and air-assisted clutch. Heat-treated, stress-proportioned, single-unit frame gives the structural stamina needed to withstand severest operating conditions. All these features, and many more, contribute to unmatched durability and minimum haulage costs.

CONDENSED SPECIFICATIONS

STANDARD EQUIPMENT

DIMENSIONS:

Wheelbase	16' 10"
Platform	14' 11½"
Overall Width	11' 2⅜"
Overall Height	11' 7⅝"
Overall Length	31' 3⅞"
Overall Height (Body Raised)	25' 2"
Turning Circle Diameter (To outside edge of tire)	78'
Weight (chassis, body & hoist)	68,000 lbs.
Payload	68,000 lbs.

ENGINE (Diesel):

Model	NVH-1200
Make	Cummins
Type	Naturally aspirated
Number of cylinders	12
Bore and stroke	5⅛" x 6"
Piston displacement, cu. in.	1486
Brake horsepower @ 2100 r.p.m. (gov.)	400
Max. torque @ 1200 r.p.m.	1,075 lb.-ft.
Fuel tank and location	150 gal., back of cab

CLUTCH:

Make	Lipe Rollway
Type	Two-plate, dry
Area of engagement, sq. in.	571
Actuation	Air

ELECTRICAL SYSTEM:

Voltage and capacity	12 V., 75 Amp.
Generator, make and type	Leece-Neville, alternator

STARTING SYSTEM:

Starting motor, type	Air
Make	Bendix-Westinghouse
Rating, horsepower	25
Cold starting aid	Ether injection

TRANSMISSION:

Type	Mack selective constant mesh
No. of speeds, forward	Four
reverse	One

TORQUE CONVERTER:

Model	Westinghouse 18"
Type	Single stage, hydraulic

FRONT AXLE:

Type	Mack Reversed-Elliott, drop-forged I-beam

BOGIE:

Make	Mack Planidrive
Final drive, type	Four wheel, planetary
Inter-axle Differential	Mack concentric cam and plunger type Power Divider
Carriers	Mack Dual Reduction
Total ratio	18.18

BRAKES:

Type and actuation	Internal expanding, inclosed, air
Front, size	17¼" x 5" x ¾"
Rear, size	20" x 7" x ¾"
Hand, size	12" x 5" x ¾"

FRAME:

Type	I-beam, wide flange
Material	Alloy steel
Side-members, size	Depth 14¼", flange width 8", flange thickness 1"
Section modulus	130.0 per side

SPRINGS:

Type	Semi-elliptic
Suspension, Mack	Rubber Shock Insulators

SHOCK ABSORBERS, FRONT:

Type	Houdaille, hydraulic

TIRES (Lug) Front and Rear:

Size	16.00-25 (20P)

WHEELS:

Type	Cast, spoke

STEERING GEAR:

Type	Worm and roller
Power steering assist	Vickers hydraulic booster

CAB:

Type	Heavy-duty off-highway, closed, all-steel, welded. Offset 10¾" to left of chassis center-line provides clear vision for driver to rear.

CHASSIS EQUIPMENT: Screen type radiator guard; hubodometer; front and rear tow pins; air horn; rear view mirror, left side; dual exhaust through hood with inline mufflers; channel type front bumper; rim lug wrench and handle; door in hood side for access to oil filler and dip stick; insulating dash mat; windshield wipers; stop and tail light; back up light; automatic radiator shutters.

HOIST:

Make & Type	Heil, twin, double-acting, outboard mounted, four-section telescopic cylinder assembly directly connected to body and chassis through a universal joint arrangement to provide maximum flexibility.
Dumping angle	70°

BODY

Make & Type	Heil Rock, scoop end
Capacity, line of plate	24 cu. yds. struck

Construction: ¼" steel plate shell bottom; ⅝" sides and header; ¾" alloy wear and side bevel plates; ½" front slope plate; ⅛" canopy. 3" x 7.1 lb. channels between floor plates either side of a 2" edge-grain hardwood middle section filler.

OPTIONAL EQUIPMENT

TRANSMISSION (In place of 4-Speed and Westinghouse Converter):

Make & Type	Mack Two-Lever, Duplex
Speeds Forward	8
Speeds Reverse	2

TIRES (Lug) Front and Rear:

Size	16.00-25 (24P)

BODY EQUIPMENT: (9) ¾" x 6" wear bars over standard ¾" alloy wear plate; 1" alloy wear plate in place of ¾" alloy wear plate; exhaust heating; rock ejectors; rock guards over tires; twin body prop; horizontal bolsters (5 per side).

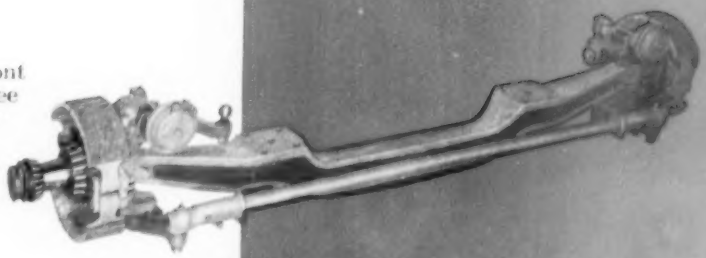
CHASSIS EQUIPMENT: Air operated Thermo-controlled radiator fan hub; Tachograph, Wagner model "BB" (24 hour chart 0-3500RPM) in place of standard Tachometer; speedometer; front wheel brake limiting valve; alcohol vaporizer; 25,000 B.T.U. hot water cab heater with defrosters; solex glass for windshield; windshield fan mounted on windshield header; fender to bumper steel treads; cab insulated; two stop-tail lights; spare rim; 20-ton hydraulic jack.

NAME FOR TRUCKS

only MACK gives you features like these...

MACK-BUILT FRONT AXLES

Mack's reversed Elliott, drop-forged I-beam front axles are made extra strong for long, trouble-free service. Extensive use of heat-treated steels for crucial parts means minimum maintenance. Straight tie rod and rugged construction of air-actuated brake shoes insure top performance.



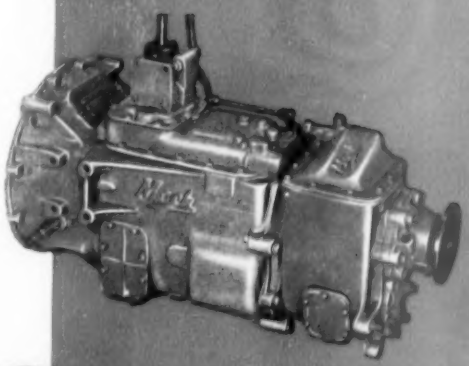
MACK-BUILT 2-WHEEL REAR AXLES

Mack's two-wheel, rear axle assemblies have an unmatched reputation for durability under strenuous service. The strongest, most wear-resistant materials are used throughout. Dual Reduction, gear-type differential and Mack's famous planetary gear reduction at the wheel hubs (Planidrive) provide the smooth distribution of power needed for top truck performance. Planetary gears can be serviced or repaired without removing tires or disturbing wheel bearing adjustment.



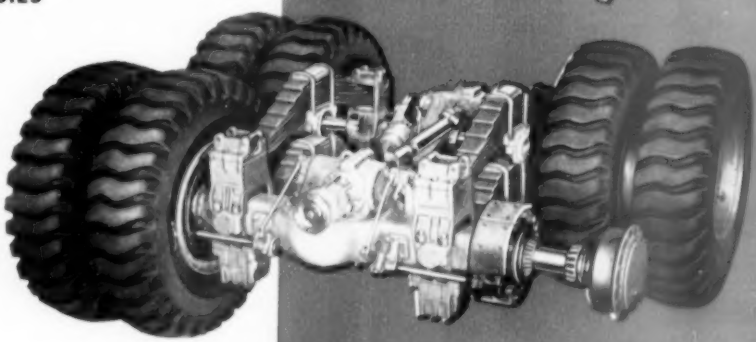
MACK-BUILT TRANSMISSIONS

Dependable performance and long life are standard in Mack transmissions. Shown here is the heavy-duty overgear transmission used for the LRVSW, LRSW, and LVX off-highway dumpers. The four-speed main transmission and two-speed compound are assembled as a unit to give eight forward and two reverse speeds. The four-speed main transmission without the two-speed compound is offered in combination with torque converter. All gears use Mack tetrapoid or quadrapoid tooth design and are drop-forged and case-hardened . . . gears noted for lasting the life of the truck.



MACK-BUILT 4-WHEEL BALANCED BOGIES WITH EXCLUSIVE POWER DIVIDER

Under the worst conditions of mud, loose gravel, or difficult terrain, you get maximum pulling power with Mack's four-wheel drive Balanced Bogies because exclusive Mack Power Dividers apply power to the wheels with traction. Planidrive final reduction gears in all four hubs provide needed reduction without excessively large carriers, differentials, or axle shafts. Maintenance is reduced to a minimum.



MACK first name for TRUCKS

Mack Trucks, Inc., Plainfield, New Jersey • In Canada: Mack Trucks of Canada, Ltd.

PEOPLE IN THE NEWS

(Continued from page 32)

General superintendent

CLAIRE F. GAUMAN has been named general superintendent of the South Amherst, Birmingham and Wakeman quarries of The Cleveland Quarries Co., Amherst, Ohio. He joined the company in 1949 as foreman of three of the South Amherst quarries, was made general foreman in June, 1956, and the following September was promoted to superintendent of the Birmingham and Wakeman quarries.

Arkansas cement officers

J. C. HAMILTON has been named president of the Arkansas Cement Corp., Little Rock, Ark., a wholly owned subsidiary of the Arkansas-Louisiana Gas Co., of which Mr. Hamilton is also president. E. N. Henderson, vice president of the parent company, has been appointed vice president of the cement corporation; Frank L. Holleman, secretary and treasurer; and Raymond H. Thornton, Jr., assistant secretary and treasurer. W. T. Murphy, Jr., Texarkana, has been named chairman of the board.

Directors of the new cement corporation, in addition to W. T. Murphy, J. C. Hamilton and E. N. Henderson, are: State Representative Marion H. Crank, Foreman; Gus Blass II, Little Rock, vice president of the Gus Blass Co.; John G. Thompson, McCrory, a partner in the Thompson Brothers Investment Co.; Truman Baker, Searcy, automobile dealer; W. R. Stephens, Little Rock, chairman of the board of Arkansas-Louisiana Gas Co.; and Olin Hendrix, Antoine, president of the Bank of Prescott.

Centennial chairman

ANTHONY BRANDENTHALER, president of the Chemical Lime Co. of Oregon, is chairman of the Oregon Centennial Commission.

AIME nominee

STANLEY D. MICHAELSON, chief engineer, western mining division, Kennecott Copper Corp., Salt Lake City, Utah, has been nominated for 1958 president of the Society of Mining Engineers of the American Institute of Mining, Metallurgical and Petroleum Engineers. He also will serve as a director of AIME. Elmer A. Jones, manager of the southeast Missouri division, St. Joseph Lead Co., Bonne Terre, Mo., is currently president and was recently nominated by the Society to be an AIME director.

Elected president

GORDON FARRELL, a director of the British Columbia Cement Co., Ltd., Victoria, B.C., Canada, has been elected president of the company to succeed Nigel Tomlin, who has retired for reasons of health. Mr. Farrell has been a director for 14 years. Mr. Tomlin has been associated with the company for 15 years, 13 of which he has been president and general manager.

Controllers director

KENNETH A. STOTLER, secretary-treasurer of the Pioneer Sand and Gravel Co., Seattle, Wash., has been elected a director of the Seattle Control of the Controllers Institute of America. Established in 1931, the Institute is a nonprofit management organization of controllers and finance officers from all lines of business, with a total membership exceeding 4,600.

Sales manager

PAUL W. CLARK has been appointed sales manager of the California division of Ideal Cement Co., Denver, Colo., succeeding A. A. Courteney, Jr., who has retired. Mr. Clark was formerly a salesman.

OBITUARIES



Louis J. Wheeler, general superintendent of the Texas Division of Lone Star Cement Corp., New York, N.Y., died suddenly on July 5 in Dallas. He was 62 years of age. A native of Detroit, Mich., and a graduate of the University of Kansas, Lawrence, Kan., with a degree in mechanical engineering, Mr. Wheeler joined Lone Star in 1921 as a draftsman at the Dallas plant. Subsequently he was made designing engineer at the plant in Cuba, later transferring to the New York office in the same capacity. From 1925 to 1932 he was assistant superintendent at the Bonner Springs, Kan., plant, later becoming superintendent at the Dallas and Houston plants. As general superintendent of the Texas Division, Mr. Wheeler supervised the plants at Houston, Dallas and Maryneal, Texas.



Burton A. Ford, semiretired vice president of the St. Regis Paper Co., New York, N.Y., passed away suddenly on August 8 at his home in Allentown, Pa. He was 63 years old. A native of Maryland and a graduate of the University of Maryland, Mr. Ford was a member of the National Lime Association staff in Washington, D.C., from 1920 to 1924, having served as general manager in 1923 and 1924. He was a regular attendant at NLA meetings for over 30 years and, in 1949, was made an honorary life member of the Association.

Mr. Ford, who pioneered the sale of multiwall bags in the lime industry, had been associated with St. Regis Paper Co. since 1928. He served as sales manager of Bates Valve Bag Corp., which was acquired by St. Regis, and continued in sales management capacities until 1953 when he was named a member of the staff of Multiwall Packaging Division.

Frank J. Dusten, treasurer of the Pennsylvania Division of Lone Star Cement Corp., New York, N.Y., passed away August 4 at his home in Nazareth, Pa. He was 52 years old and had been treasurer of the firm for 11 years.

William H. Constantine, sales manager of the Keystone Portland Cement Co., Philadelphia, Pa., for the past 29 years, died August 17. He was 58 years old.

END

GUARD BEARINGS against their two worst enemies

● *Wear and rust are your bearings' worst enemies—but you can lick them both with* ***Texaco Marfak***



Photo courtesy Iowa Manufacturing Company

One large manufacturer ships all his contractors' equipment *Marfak*-lubricated and recommends Texaco exclusively by instruction plate. He says:

"Our long experience shows *Texaco Marfak* to be the best lubricant for the heavy duty service, shock loads and high temperatures our equipment often meets on the job."

For wheel bearings, use *Texaco Marfak Heavy Duty 2*. It, too, protects against wear and rust—seals out dirt and moisture, seals itself in, assuring safer braking and thousands of extra miles between repackings. No seasonal change is required.

For a multi-purpose lubricant, use *Texaco Marfak Heavy Duty Special 2*. It's a lithium-base grease that pumps easily, lubricates effectively regardless of temperature, resists water washing and stands up in severest service.

For your air compressors, use *Texaco Regal Oil R&O*. It keeps systems clean, lines clear—assures dependable performance. For wire rope and open gears, use *Texaco Crater* or (for spray application) *Texaco Crater X Fluid*.

A Texaco Lubrication Engineer will gladly help you select the proper lubricants for all your equipment. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

☆ ☆ ☆

The Texas Company, 135 East 42nd Street, New York 17, N.Y.

TEXACO

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

Enter 1547 on Reader Card

Perhaps you've noticed . . .

that CONCRETE PRODUCTS now is being published separately and no longer is part of ROCK PRODUCTS.

CONCRETE PRODUCTS has been enlarged and considerably broadened in scope editorially to cover the growing concrete products industries more adequately. For information on obtaining regular monthly issues of the brand new CONCRETE PRODUCTS, write to

CONCRETE PRODUCTS
79 West Monroe St.
Chicago 3, Ill.

Set up firm to sell fly ash

FLY ASH WILL BE OFFERED in Milwaukee by a local source for the first time when Milwaukee Fly Ash, Inc. begins operations in about three months. The firm will engage in distribution of the product and also do research on fly ash in an effort to discover new uses for it.



Asbestos company drains Canadian lake for mining

AMERICAN SMELTING AND REFINING CO. has released its first complete report on the engineering problems and progress its subsidiary, Lake Asbestos of Quebec, Ltd., has encountered in a $32.5 million project to mine asbestos deposits under a 2 x ½-mi. lake in Canada.

By pumping, engineers are lowering the surface of Black Lake, Quebec, over 300 ft. before completely draining it for open-pit mining. Work is proceeding on schedule, with about half of 37 million cu. yd. of material overlying the asbestos deposits already removed, and construction of a $9.2 million mill is well advanced. By early next summer, initial mining operations and tune-up runs in the mill should be underway. Output will be 100,000 tons of asbestos fiber a year from 40-year reserves. This is a seven percent addition to the free world supply of asbestos fiber.

The tremendous amount of material to be removed in readying the ore for open-pit mining is more than double that being taken out in the construction of the St. Lawrence Seaway. Overburden is being removed by a 30-in. suction dredge which pumps it across the lake and through several miles of steel pipeline to a disposal area where mud spills out at a rate of 50,000 gallons per minute. Though the dredge and equipment cost about $3 million, the cost of removing material by this method is about one third that for mechanical power removal.

Since the lake had to be removed

(Continued on following page)

New cement company laboratories

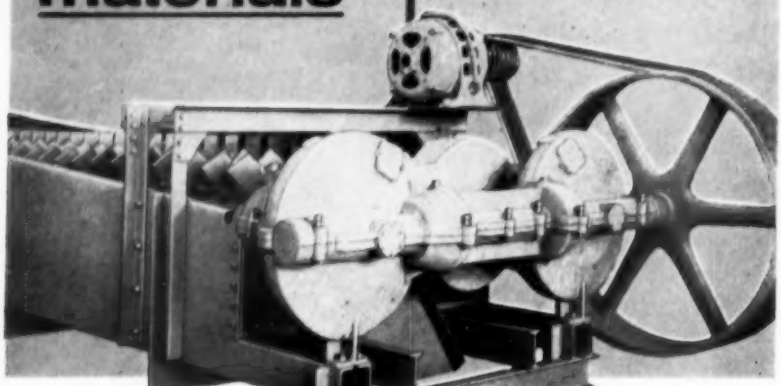


BY LATE SPRING OF 1958 the Crestmore plant of the Riverside Cement Co., Los Angeles, will have a $661,550 office and laboratory building with the most modern facilities available. The building itself is to be a showcase for concrete products and will feature lightweight concrete block, color concrete panels, floating staircases, precast sunshade units and a cement tile mural in the lobby.

One wing of the structure will contain laboratories on the ground floor and drafting and engineering offices on the second floor. In the other wing above a first-floor garage will be a conference room and offices, grouped about an inner patio. A penthouse will hold mechanical and telephone equipment.

High Capacities of clean materials

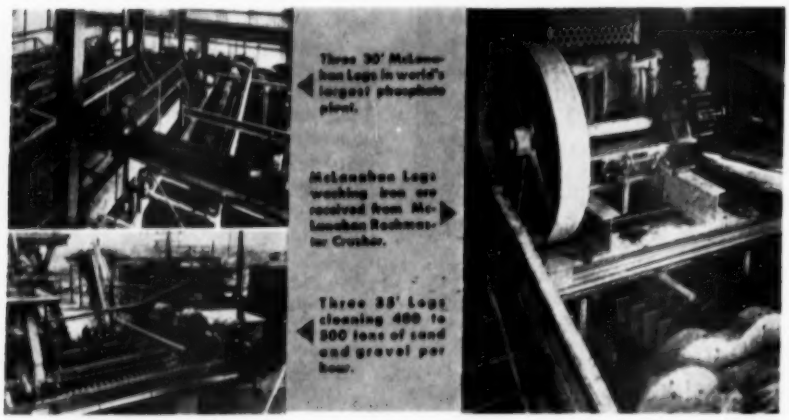
Developed from the world's first all-steel log washers built by McLanahan & Stone in 1894, these machines produce high tonnages of exceptionally clean materials—removing tough clay, soft rock and refuse with unequalled speed and economy. Available in Heavy-Duty and Mudmaster styles. *Write for Bulletins WLO-1155 and MM-755.*



McLANAHAN SINCE 1835

LOG WASHERS

McLANAHAN & STONE CORPORATION
252 Wall Street, Hollidaysburg, Pennsylvania



Enter 1567 on Reader Card

INDUSTRY NEWS

(Continued from preceding page)

from the drainage system of the area, the firm dug a river channel to by-pass the lake so that the area wouldn't be flooded.

Setting it straight—

ROCK PRODUCTS has received information (see following letter) that certain data in our story, "Unusual Technique Reduces Abrasive Wear," July 1957, p. 94, is incorrect. Although we were assured by our source that the information had been checked and cleared by all parties concerned, this unfortunate error occurred and we apologize to our readers.—the editors.

Mr. G. C. Lindsay
ROCK PRODUCTS
79 W. Monroe Street
Chicago 3, Ill.

Dear Mr. Lindsay:

In your July issue of ROCK PRODUCTS you printed an article on pages 94 and 96 entitled "Unusual Technique Reduces Abrasive Wear."

This article deals with the hard surfacing of die rings used in Bradley Hercules Mills when grinding Cement Clinker.

This article was printed without the consent of the Bradley Pulverizer Company and contains many inaccuracies and claims for the hard surfacing material which were never made by the Bradley Pulverizer Company.

We wish to point out below the misstatements contained in the printed article. In doing this we will quote directly from the article and then state our comments.

Rock Products—

"The extremely abrasive nature of cement clinker makes die ring wear an important criterion when selecting a *finish grinding mill*. For this reason, Bradley Pulverizer Company has invested considerable time and money in research and development program designed to improve die ring wear resistance."

Bradley comments—

The above indicates that the Bradley Hercules Mill is a finishing mill for grinding cement clinker. This is not so. The Bradley Hercules Mill is a preliminary pulverizer designed to take run of kiln clinker and produce a superior feed for the finishing mills whether they are tube or compartment mills, resulting in increased output for the finishing

mills. We have many such applications in operation, but we have never claimed that the Bradley Hercules Mill is a finishing mill. The Bradley Pulverizer Company has spent and is still spending considerable time and money in programs designed to improve the wearing quality of die rings.

Rock Products—

"They (Bradley Pulverizer Company) have studied various base materials, heat treatments and surface coatings including almost every commercially known hard facing alloy. Of all materials tested best results were achieved with a standard die ring base of carbon steel with an application of a combination of alloy rod and paste-type hard facing materials."

Bradley comments—

While the Bradley Pulverizer Company has experimented and tested, under actual operating conditions, with the cooperation of various Bradley Hercules Mill users, die rings made of Nickel iron alloy, chrome iron alloy, die rings coated with various types of hard surfacing materials, we have never and do not now claim that "of all materials tested, best results were achieved with a standard die ring base of carbon steel with an application of a combination of alloy rod and paste-type hard facing materials." Some of our customers use an alloy cast ring and some use a hard surface coated ring. We supply our customers with that type of ring which they have found most suitable for their application. We have not, as yet, found a die ring either cast or coated that we can state definitely is superior to all others for all clinker applications.

Rock Products—

The article refers to the cost analyses and experience of Universal Atlas at Northampton, Pa. when using die rings coated with a combination of alloy rod and paste-type hard facing materials in a Bradley Hercules Mill grinding white cement clinker.

Bradley comments—

In all fairness to other users of Bradley Hercules Mills it should be forcibly pointed out that the Bradley Hercules Mill application at the Universal Plant at Northampton is not a typical Bradley Hercules Mill installation so far as clinker grinding is concerned. The Bradley Hercules Mill at this plant is grinding a white cement clinker which is considerably softer and less abrasive

(Continued on page 46)



McLANAHAN SINCE 1835

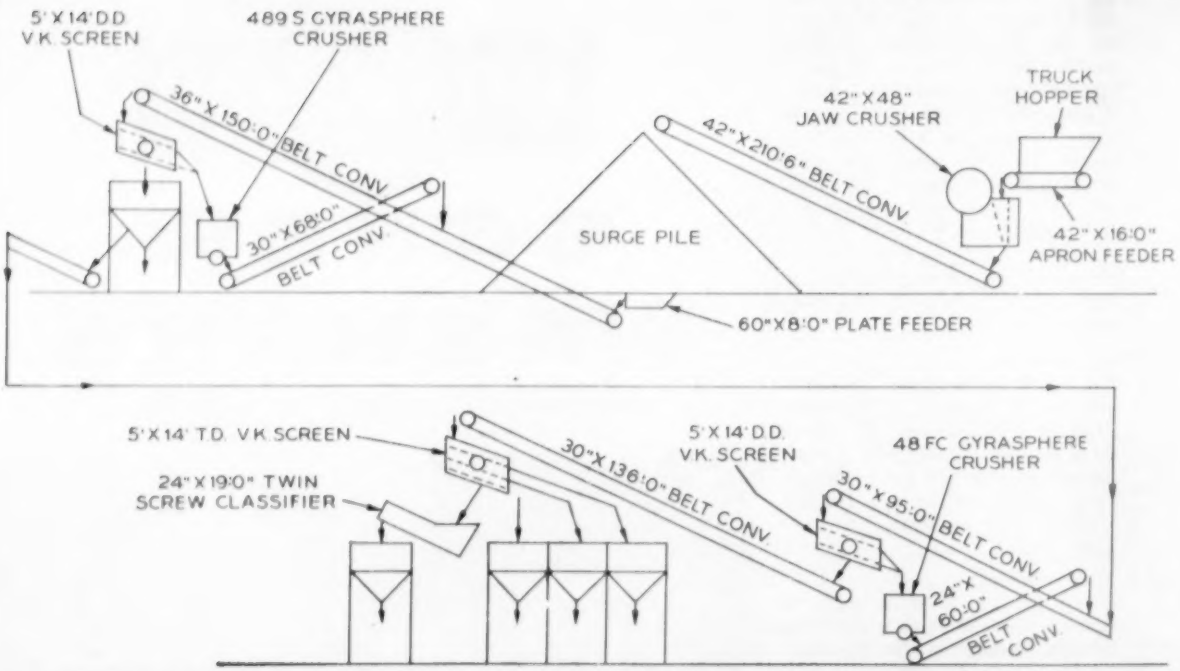
SCREW WASHERS

McLANAHAN & STONE CORPORATION
252 Wall Street, Hollidaysburg, Pennsylvania



Enter 1601 on Reader Card





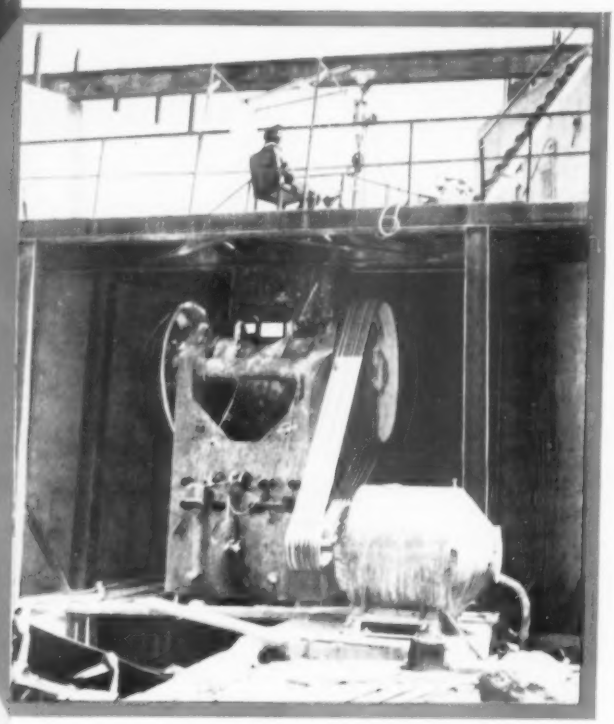
SMITH ENGINEERING WORKS

508 E. CAPITOL DRIVE **MILWAUKEE 1, WISCONSIN**

Representatives in Principal Cities in All Parts of the World • Cable Address: Sengworks, Milwaukee

TELSMITH®

designed **and** *equipped*



GAINESVILLE STONE CO. plant
Gainesville, Georgia

Owned by JOHN RUTH and WALLACE MORGAN

PRIMARY CRUSHING PLANT — **Telsmith 42" x 48" Roller Bearing Jaw Crusher,** with **Telsmith 42" x 16' Heavy Duty Apron Feeder,** delivers 300-400 tons hourly of minus 7" material to the surge pile. Send for Bulletin 280 describing this new, big capacity jaw crusher with welded steel frame.

FINISHING PLANT— **All Telsmith equipped** — makes 200-225 tons hourly of minus 1¼" material. Minus 1¼" plus ¾", minus ¾" plus 4 mesh, minus 4 mesh are typical sizes. Other sizes are made by changing screen cloth.

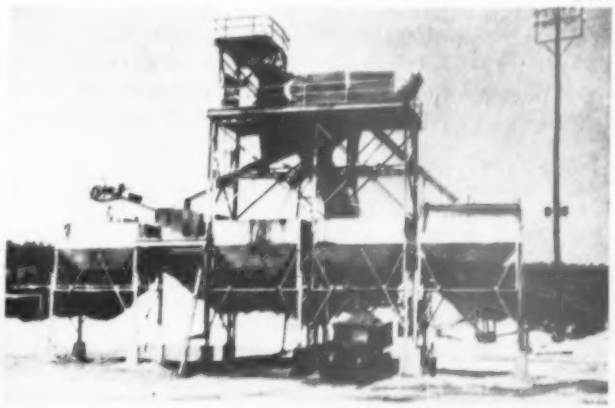
Primary Plant works 10 hours a day. The Finishing Plant works 16 hours a day, producing 3 or 4 sizes for use in batch plants and for county and state highway construction. Send for Bulletin 266 describing Telsmith Complete Plant equipment.

Telsmith 5' x 14' Double Deck Vibro-King Screen and 489-S Gyrasphere Crusher.



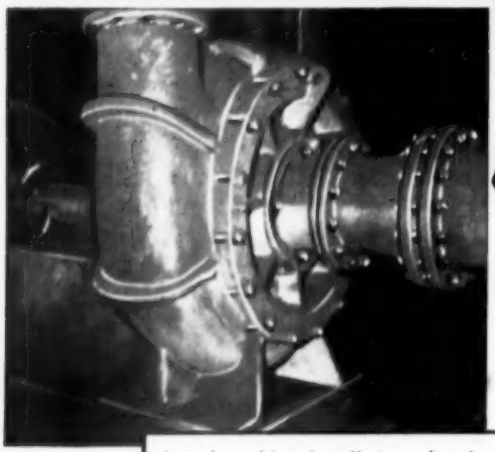
Telsmith 5' x 14' Triple Deck Vibro-King Screen and 24" x 19' Twin Screw Classifier.

Q-36



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Continuous Low-Wear Non-Clog Solids Pumping... At Lower Cost



Morris

low-speed wide-clearance SOLIDS PUMP

Actual working installation of a low-speed, wide-clearance Morris Solids Pump which handles fine solids at a rate of 6,000 gpm at 52' total head. Pump speed only 370 rpm, 14" suction opening, 12" discharge.

Where total heads do not exceed about 120 feet, low-speed, wide-clearance Morris Type-M Solids Pumps will handle solids ranging from fine abrasives up to pieces 11" in diameter. The low-speed reduces the abrasive action of the smaller particles, the large clearance allows larger solids and "tramp" pieces to pass without trouble.

Longer Wear, Easier Maintenance

Designed so that the most important wearing parts receive the least wear, initial high mechanical and hydraulic efficiencies are maintained throughout the longer service period of the pump. Double-thick wearing parts are sub-divided and protected so that the greatest erosion is taken by easily replaced segments. That means speedy, easy renewal, less down-time and lower maintenance cost.

Free Consultation

Morris engineers are always available to discuss and study your pumping problems with you. Describe your needs in a letter—or call your nearest Morris office. Our recommendations are free—entail no obligation. Write for Bulletin 175 which describes the Type M Solids Pump in detail.

MORRIS MACHINE WORKS
Baldwinsville, N. Y.
Sales Offices in Principal Cities

MORRIS *Centrifugal Pumps*

Enter 1570 on Reader Card

INDUSTRY NEWS

(Continued from page 33)

than standard grey cement clinker. In addition the speed of this particular Bradley Hercules Mill has been reduced from our normal 128-133 r.p.m. to about 110 r.p.m., thereby greatly reducing the grinding pressures between the die ring and roll heads. So it follows that the die ring service duty under the above operating conditions, whether it be an alloy cast ring or a hard surface coated ring, can in no way be compared with a die ring in a Bradley Mill operating under normal clinker grinding conditions, which is every one of our installations except at the Northampton Plant of Universal Atlas.

Thus the Bradley Pulverizer Company cannot condone the article published in ROCK PRODUCTS July issue, pages 94-96, for it gives information and makes statements and claims for a product that is inferred to be applicable to the entire field of clinker grinding in Bradley Hercules Mills.

We cannot and will not support such inferences, as the actual performance of the product in question is based on a special application of a Bradley Hercules Mill, which subjects the Mill to far less abrasive wear and tear than our standard installations.

Yours very truly,

BRADLEY PULVERIZER COMPANY
Peter B. Bradley
General Manager

U. S. Chamber of Commerce defends minerals industry

THE NEW "POLICY DECLARATIONS" of the Chamber of Commerce of the United States contains this paragraph:

"Local governments, in establishing rural zoning ordinances, should recognize that mining of valuable mineral deposits is a legitimate land use and necessary to the welfare of the community and to its planned development. Zoning ordinances should preserve the right to develop mineral deposits when mining is the highest and most beneficial use to which the land may be dedicated."

According to Vincent P. Ahearn, executive secretary of the National Sand and Gravel Association, credit is due to William E. Hole, president of the American Aggregates Corporation, for his initiative in proposing this addition to the policy declarations of the chamber.

(Continued on page 50)

Enter 1571 on Reader Card

HIGH-PRODUCTION ROCK HAULER



CAT* DW21-PR21 units climb stiff grades, make 600-yard round trips in 6½ minutes cycle time

This is one of two DW21 Tractors with Athey PR21 Rear Dump Trailers used by Newport Excavating Co. to haul from an open pit at Nanticoke, Pa. Shovel loaded, each unit handles an average load of 25 cubic yards of rock, pulls it up a 7½% grade out of the pit, and makes the 600-yard round-trip in 6½ minutes.

These big, tough haulers work steadily, 24 hours a day, five days a week. Their short turning radius and great maneuverability make them fast workers around the shovel and on the dump.

Perfectly matched to the rugged PR21, the new Caterpillar DW21 (Series C) develops high usable rimpull; its heavy-duty Turbocharged Cat Engine delivers 300 HP (maximum output). What's more, because of its four-cycle design, the engine gives you *dependable* power with a minimum of maintenance. No fuel adjustments are required. There are no cylinder ports or air boxes to clean. And low-cost No. 2 furnace oil can be used without fouling.

Among other features that boost production are: automotive-feel, hydraulic steering for easy, fast maneuvering and wide-section 29.5 x 29 tubeless tires for maximum flotation and sure-footed traction. Tubeless tires, pioneered in earthmoving use by Caterpillar, save tire down time and bring real cost savings over old-fashioned tubes and flaps.

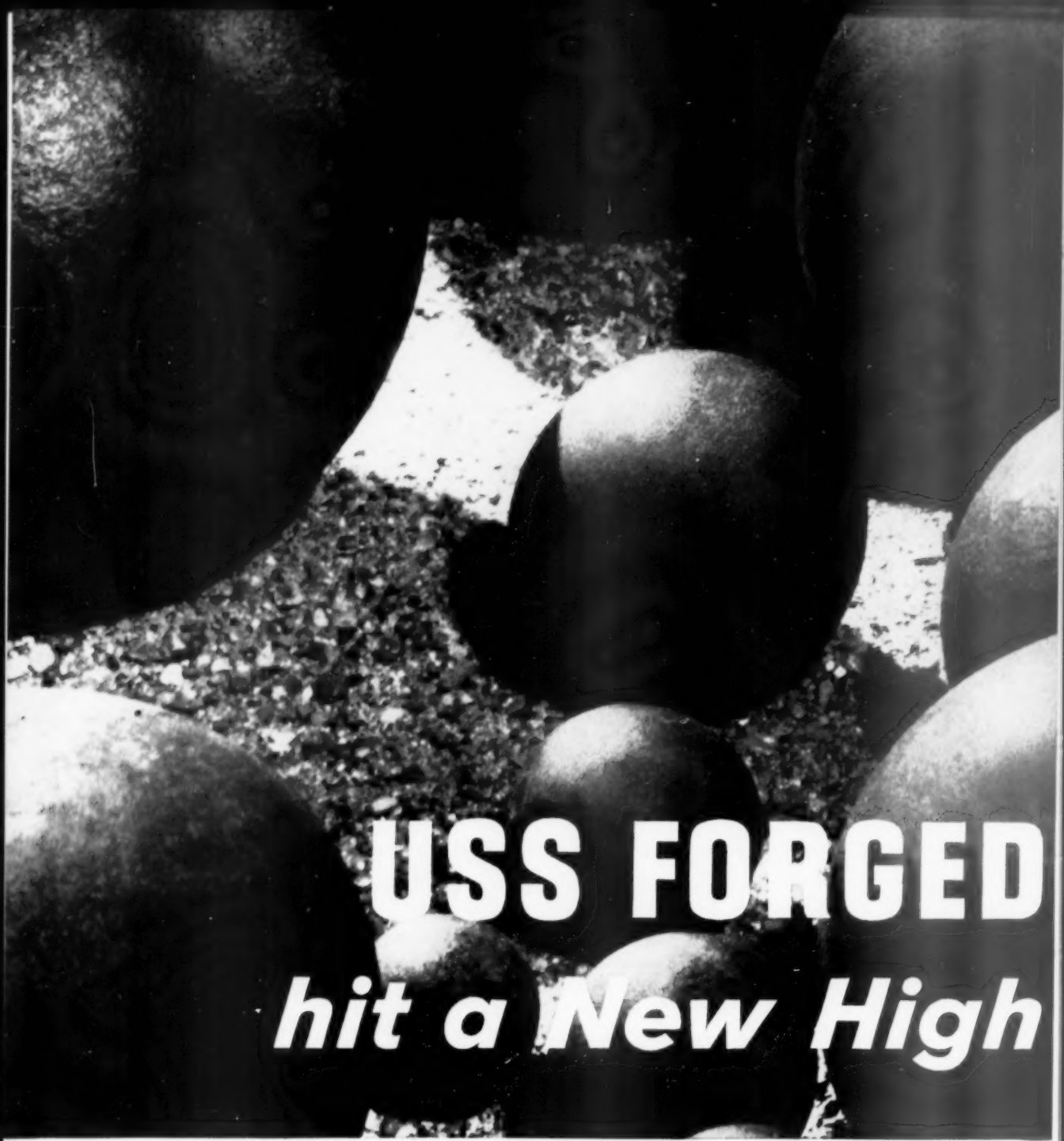
For high, steady production you can't beat the DW21-PR21 in rock work. Your Caterpillar Dealer, who backs you with prompt service and parts you can trust, will gladly give you complete details of its performance. Call him today!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

HEAVY-DUTY EQUIPMENT FOR THE HARD WORK



USS FORGED
hit a New High

NEW MANUFACTURING FACILITIES at U. S. Steel have now made possible forged steel grinding balls with three outstanding characteristics:

HARDNESS

The hardness patterns obtained in USS Grinding Balls assure superior grinding qualities and long service life in all types of grinds.

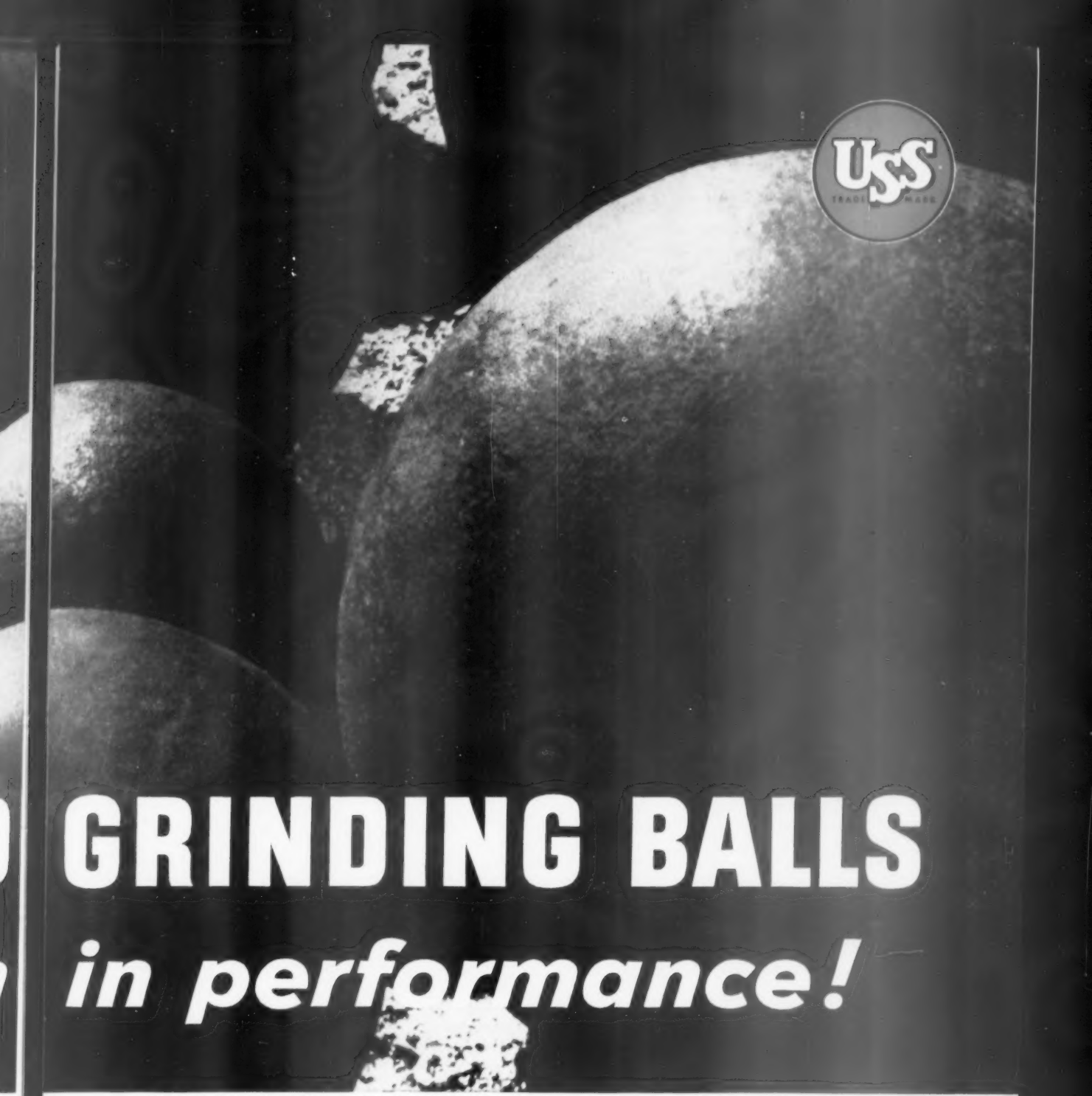
TOUGHNESS

To resist breakage, each size and type of USS Grinding Ball has the maximum toughness compatible with its depth of hardness.

UNIFORMITY

The exacting controls that are necessary in processing, particularly heat treatment, combined with frequent laboratory checks, insure consistency in quality—ball to ball and load to load.

There are two types of USS Forged Steel Grinding Balls available: USS Carbon-Manganese, for most mill operations, and USS Alloy Steel, for unusually severe grinding conditions. Both types are manufactured in the same sizes: ¾", ⅞", 1", 1¼", 1½", 2", 2½", 3", 3½", 4", 5". To find out what makes the "good" grinding ball *you* need, send for our new free booklet, today. Just fill out and mail the coupon.



GRINDING BALLS

in performance!

Photo above is magnified. Maximum ball size is 5".

USS FORGED GRINDING BALLS

UNITED STATES STEEL CORPORATION, PITTSBURGH
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

United States Steel Corporation
525 William Penn Place, Room 5654
Pittsburgh 30, Pennsylvania

Please send me a copy of "USS Forged Grinding Balls."

Name .....

Company .....

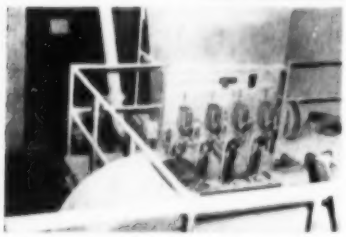
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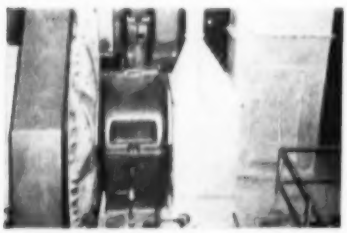
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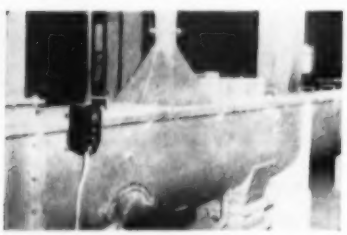


Connected to a 4-station St. Regis packer, this 12-foot Sly Dust Filter exhausts 9,000 cfm.

LONE STAR saves with SLY DUST CONTROL


Dust hood at 4-station St. Regis packer.


Dust hood at one of the ball mills.


Dust hood leading from 24" screw conveyor.

Cleanliness pays off in this Lone Star Cement Corporation plant where Sly Dust Filters give an *all star* performance, 24 hours a day, day after day.

These filters collect dust at critical points — save cement — effect operating economies — assure a cleaner plant. For Sly Dust Filters are designed and built with an abundance of cloth for greater filtering capacity and a 100% filtering job.

Top notch performance with *"no appreciable maintenance"*— such is the record of Sly in this plant as in thousands of others. Long experience, as pioneers in the field, provides a background for the advanced engineering Sly users receive.

If you have a dust problem, let's talk it over. Ask for Bulletin 98 — full of helpful information on controlling dust, *economically.*

Designers and Manufacturers of: Dust Control Systems, Blast Cleaning Equipment, Tumbling Mills, Industrial Ovens.

THE W. W. SLY MANUFACTURING CO.
SINCE 1876
4746 TRAIN AVENUE • CLEVELAND 1, OHIO
OFFICES IN PRINCIPAL CITIES

Enter 1504 on Reader Card

INDUSTRY NEWS

(Continued from page 46)

Alcoa to close alumina plant in East St. Louis

ALUMINUM CO. OF AMERICA said it will stop production of alumina at its East St. Louis, Ill., plant on November 1, but production of aluminum fluoride, cryolite and other chemical products will be continued. The company said the cutback, affecting approximately 500 of the plant's 1,250 employes, was caused by changes in its supply of bauxite. Most bauxite is now sent from South America and processed at coastal points. Some workers affected by the shutdown will be offered transfers to other plants, while most of the others will be eligible for company supplemental unemployment benefits or retirement benefits, Alcoa said.

Double duty plant almost completed

CANADA'S LAKE ONTARIO Portland Cement Co. Ltd., has shipped the first load of material from its newly finished $2,500,000 aggregate plant, and expects the companion $14,000,000 cement plant in operation by the middle of November. H. J. McFarland, mayor of the nearby town of Picton and the new firm's largest shareholder, said the combined plant will be one of the most economical to operate in the country.

"We are sitting right on top of more than 150 years' supply of raw materials, with an 85-ft. rock face to work on, alongside a deep water harbor. Waste will be kept to the barest minimum, with the fine dust and rock particles from the aggregate plant utilized in cement manufacture," he said. The aggregate plant has a capacity of 600 tph.

Pavement yardage

AWARDS OF CONCRETE pavement for the month of July, and totals for the first seven months of 1957 are listed as follows by the Portland Cement Association:

	Sq. yd. awarded during July	First 7 mo.
Roads	4,580,595	31,718,402
Streets & Alleys	3,470,686	17,596,851
Airports	844,515	12,227,768

Quarry is incorporated

PINT'S QUARRY, INC., a limestone firm in Raymond, Iowa, has been capitalized at $150,000, with H. E. Pint as president of the new operation.

(Continued on page 57)

How many hundred dollars will this ad save you?



Both K-2 and K-4 links are shown at the left. When wide buckets are used, Kensington's special 4-hole K-4 makes it possible to use one strand instead of two . . . *and that single KENKROME chain will be stronger than two ordinary No. 844 chains!*



How much do you spend each year to replace elevator chains and sprockets?

Be sure to include the labor needed to make each change. And don't forget loss in production while your plant is shut down for repairs.

Now figure the money you'd save by using a chain that outlasts ordinary chains 2 to 4 times. That's what you can expect from the improved KENKROME No. 844 Heavy Duty Elevator Chain shown above!

KENKROME is no ordinary steel . . . in fact it's no ordinary manganese steel. There's no other steel quite like it.

Addition of special alloying metals under a patented process, plus Kensington's own scientific method of heat treatment, have created this remarkable metal which defies wear by developing surface hardness under impact to better enable it to withstand abrasion. Beneath this continually hardening surface, the metal always remains tough . . . better able to withstand shock than are metals that are hard all the way through.

But Kensington's wear-conquering engineers didn't stop with development of the metal itself. They redesigned the physical characteristics of the links. Note, for example, how the extra-heavy 1¼" pin is held in place. Even in those rare instances when a pin *does* break, it can't fall out, for on one end a cotter pin fits over its head, and on the other, a cotter pin passes through both pin and extended boss. Pins have T-head so they may be reversed. They fit link holes that are drifted to close tolerances. Links are extra heavy . . . heavier than in any other No. 844 built.

The Renewable Tooth Sprocket is another example of Kensington's improved design. Tooth segments can be replaced by two men during lunch hour . . . without even removing the chain! And a new set of teeth costs but a fraction of what you'd pay for a complete one-piece sprocket.

KENKROME Chains and Sprockets are built to fit all standard conveyors and elevators used in rock, gravel, and cement plants. It will pay YOU to *Switch to KENKROME!*

To find what it will cost, just fill in and mail the coupon. You'll be under no obligation.

Other wear-resisting alloyed ORO manganese replacement parts



Elevator buckets that last longer, seldom need replacing.



Crawler treads for all sizes and types of shovels and draglines.



Replacement parts for roll and jaw crushers, ball, rod, tube, hammer mills.



Crawler sprockets for most shovels and draglines.

Kensington STEEL COMPANY

KENSINGTON STEEL CO., Dept. R, 505 Kensington Ave., Chicago 28, Ill.

SUBSIDIARY OF POOR & COMPANY • CHICAGO

☐ Please quote prices ☐ Please ask salesman to call

Chain Information CHAIN NO. ____ TYPE ____ LENGTH ____ ATTACHMENT NO. (OR 2 BOLT PINS) ____ SPACED EVERY ____ PITCH ____

Sprocket Information CHAIN NO. ____ NO. TEETH ____ SHAFT DIA. ____ HUB LENGTH ____ ☐ CENTRAL ☐ OFFSET ☐ KEYWAY ☐ BUSHED

NAME ____

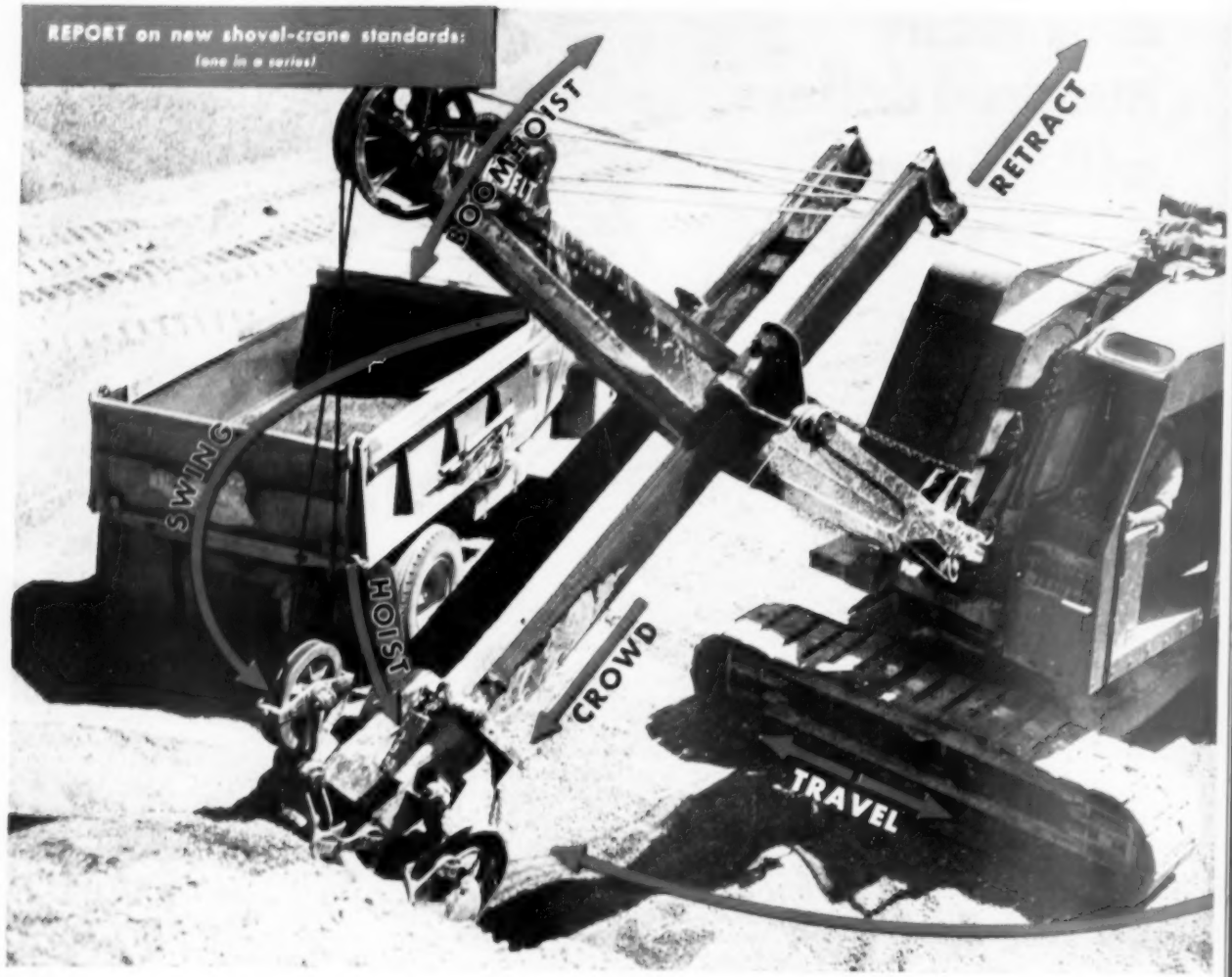
COMPANY ____

ADDRESS ____

CITY ____ ZONE ____ STATE ____

Enter 1550 on Reader Card

Saves 20-30 seconds



ALL OPERATIONS ARE COMPLETELY INDEPENDENT— In addition to eliminating shifting time, *Independent-Travel* allows the operator to swing and hoist the load while travelling. Whether to save time or to jockey the boom around obstacles, the operator can swing the boom while his machine is travelling in either direction. This optional feature can be used with any front-end attachment.



MORE USABLE HORSEPOWER — Size for size, Link-Belt Speeder shovel-cranes utilize more of the engines' available horsepower. This bonus pays off in added power at the bucket teeth, greater line pull plus extra power to swing, hoist and travel. Although it gets more usable power and line pull out of the same engines used in other shovel-cranes, a Link-Belt Speeder remains well within the engine manufacturers' recommended operating speeds.

each machine move

Independent-Swing-and-Travel eliminates shifting from swing to travel . . . permits easy moves . . . encourages operators to work machines close to bank where horsepower is used to best advantage.



USERS of Link-Belt Speeder shovels and draglines are setting new high production standards by equipping their machines with *Independent Swing and Travel*.

Optional on 11 models, this feature eliminates time losses occurring when operators shift from swing to travel and from travel to swing. With *Independent Travel*, shifting is eliminated and the machine can swing and travel simultaneously.

Particularly valuable on pit operations

Not only does *Independent Travel* simplify the operator's job, it also conserves his energy . . . helps encourage him to push his Link-Belt Speeder to its exceptionally high limit—all shift long. Furthermore, because the operator knows he can move away from banks in less time than it takes to read this sentence, he's confident, aggressive. He stays in close to the bank, can operate with the attachment at the best digging angle.

Another way *Independent Travel* pays off is that the operator can immediately, effortlessly move his rig along the bank.

Speed, maneuverability, safety

Owners of machines equipped with *Independent Travel* report that this feature gives them a high percentage of work time spent in actual productive effort. What's more, they say it greatly decreases operator fatigue, keeps end-of-the-shift output at previously impossible high levels. In addition, because all operations are independent of each other (as shown in the illustration at left), the shovel maneuvers more readily in tight quarters and is able to move away from bank cave-ins in a split second.

Cuts maintenance bills

The design of *Independent Travel* calls for separate power trains, separate clutches, shafts, gears and bearings for swing and travel. As opposed to ordinary machines—which have but one power train to perform both functions and therefore have these components in almost constant use—the Link-Belt Speeder with *Independent Travel* separates the functions . . . divides total wear over two power trains. Life of shafts, clutches, gears and bearings is greatly increased.

This is but one of many reasons why Link-Belt Speeder machines are completely revising existing standards of high-speed, high-profit shovel-crane operations. Contact your Link-Belt Speeder distributor or write Link-Belt Speeder Corporation, Cedar Rapids, Iowa.

14.507



SIMULTANEOUS SWING AND TRAVEL — *Independent Travel* eliminates shifting from swing to travel, from travel to swing and provides completely independent control. And fingertip operated Speed-o-Matic — the only true power hydraulic system—makes every shovel-crane movement fast, easy, positive. With a flick of the wrist the operator puts his machine through its paces. There is little, if any, end-of-the-shift letdown.



LESS MAINTENANCE — Self-compensating hydraulic pistons automatically adjust the clutches . . . eliminate operator's daily clutch adjustments for heat expansion and normal lining wear. With Speed-o-Matic, hydraulic pressure does the job.

It's time to compare . . . with

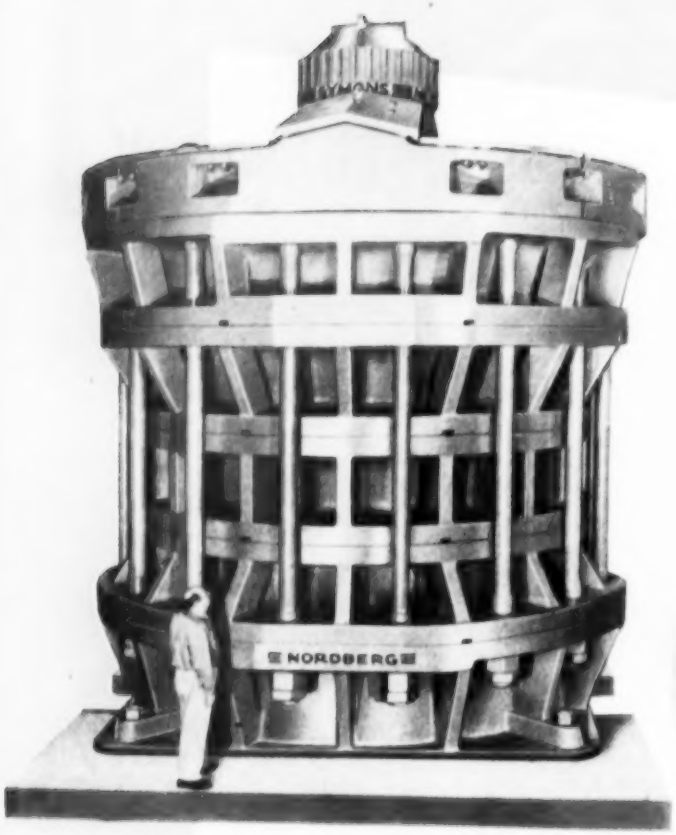
LINK-BELT SPEEDER

Builders of a complete line of shovel-cranes . . . with exclusive Speed-o-Matic power hydraulic controls

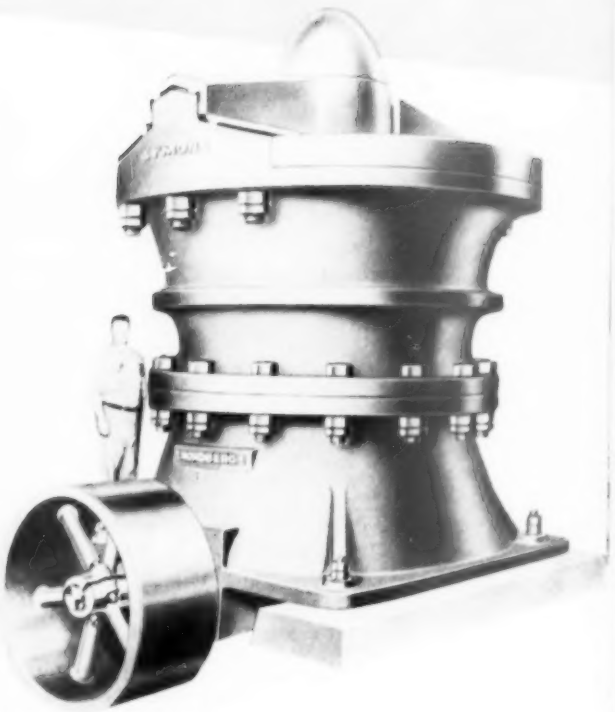
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SYMONS

GYRATORY AND
FOR PRIMARY AND



SYMONS 60" GYRATORY CRUSHER



SYMONS 30" GYRATORY CRUSHER



SYMONS
VIBRATING SCREENS



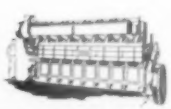
NORDBERG BALL,
TUBE AND ROD MILLS



SYMONS
VIBRATING GRIZZLIES



NORDBERG
MINE HOISTS

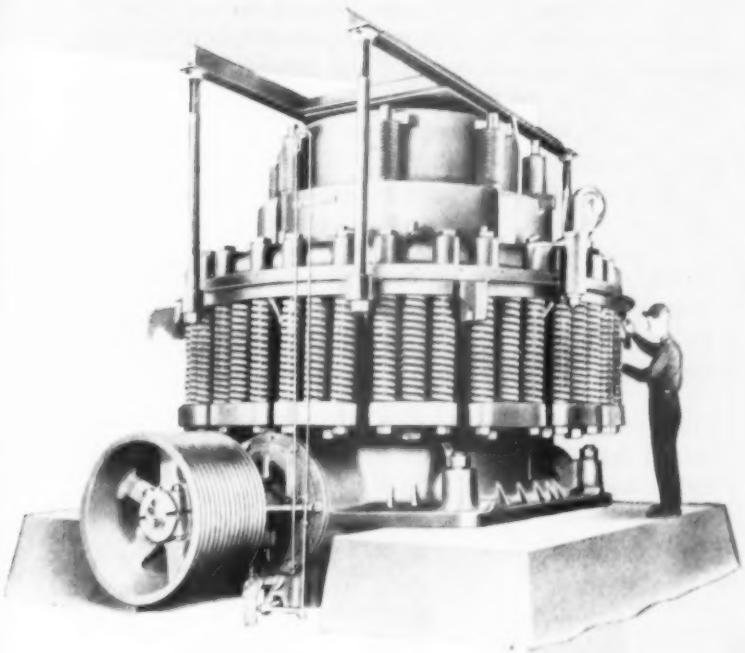


NORDBERG DIESEL—DUAFUEL® and
SPARK-IGNITION GAS ENGINES

CONE CRUSHERS FINE REDUCTION

. . . greater productivity through more efficient crushing

Complete range of sizes from 6 to over 3500 tons per hour



SYMONS 7′ EXTRA HEAVY DUTY CONE CRUSHER

All over the world, for big tonnage requirements and heavy duty crushing operations, Symons Gyratory and Cone Crushers are the outstanding choice of the mining and quarrying industries . . . because they *assure maximum and continuous production at low operating and maintenance costs.* For heavy duty primary breaking, Symons Gyratory Crushers are available in 30″, 42″, 54″, 60″ and 72″ sizes, for capacities up to 3500 and more tons per hour. For secondary and finer reductions, Symons Cone Crushers, in both Standard and Short Head types, are available in sizes ranging from 22″ to 7′—in capacities from 6 to 900 or more tons per hour.

Write for further information—Nordberg stands ready to serve you.

NORDBERG MFG. CO., Milwaukee, Wisconsin

© 1956, Nordberg Mfg. Co.

C256

SYMONS . . .

A REGISTERED NORDBERG TRADEMARK

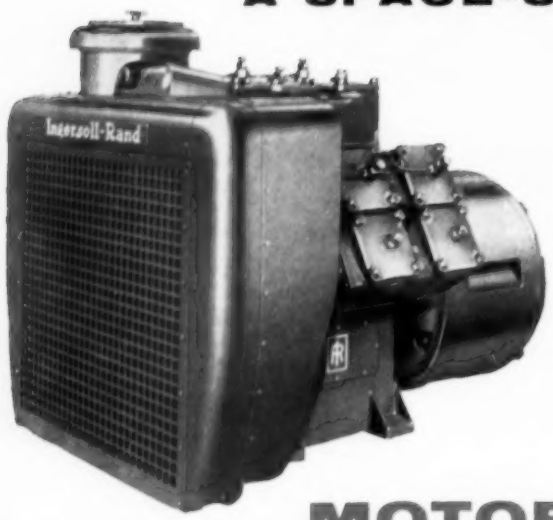
KNOWN THROUGHOUT THE WORLD

NORDBERG

MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

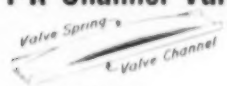
NEW YORK • SAN FRANCISCO • DULUTH • WASHINGTON
TORONTO • MEXICO, D.F. • LONDON • JOHANNESBURG

A SPACE-SAVING, READY-TO-GO



125 hp
TWO-STAGE AIR-COOLED
MOTORCOMPRESSOR

- Easy to install
- No water jackets or piping
- No freezing problem
- Air cooled intercooler
- Constant speed or dual control
- I-R Channel Valves

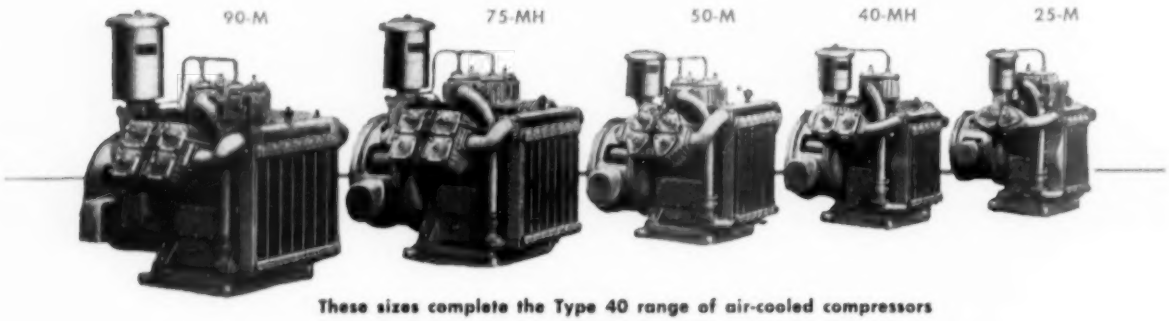


High Efficiency
Quiet Operating
Exceptional Durability
Entirely Different
Stainless-steel Channels and Springs
Air-cushioned action
Found only on I-R compressors

Newest addition to the Ingersoll-Rand line of Type 40 compressors, this heavy-duty, air-cooled unit offers new convenience and economy for the generation of 80-125 psi air power in the 125 hp class. Shipped fully assembled, its compact, well-balanced design and small foundation requirements cut installation costs. And efficient two-stage compression with intercooling to near ambient temperature, reduces power costs all year around.

Choice of constant-speed control, automatic start-and-stop control and manual or automatic dual control affords the most efficient capacity regulation for your particular operating requirements.

For complete information on all the time-saving, cost-saving features of this 125-hp Motorcompressor, send today for your copy of Bulletin 3188.



These sizes complete the Type 40 range of air-cooled compressors

Ingersoll-Rand

1-403

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COMPRESSORS • GAS AND DIESEL ENGINES
ROCK DRILLS • PUMPS
TURBO-BLOWERS • AIR AND ELECTRIC TOOLS

INDUSTRY NEWS

(Continued from page 50)

Monazite deposit found in Wyoming

THE LITTLE JIM MINING CO. has announced the discovery of a multi-million dollar monazite mineral deposit near Dubois, Wyoming. Rex Robertson, owner of the firm, said the deposit is 11½ miles long, believed to be the only high quality deposit of such a size in the United States. The discovery is especially rich, he added, because of the access to plenty of water for dredging.

Robertson felt there were several million tons of monazite sands in the deposit, running 20 to 40 lb. per yard of gravel. The material carries about seven percent thorium, he said, which is essential for commercial atomic power plants.

Portland cement production

PRODUCTION OF FINISHED portland cement in May 1957, as reported to the Bureau of Mines, U.S. Department of the Interior, totaled 27,485,000 bbl., a decrease of seven percent from May 1956. Mill shipments in May 1957 amounted to 28,940,000 bbl., a decrease of nine percent compared with last year's total. Stocks of 33,175,000 bbl. of finished portland cement on hand May 31, 1957, were 27 percent more than those on hand May 31, 1956. Clinker production during May 1957 totaled 26,397,000 bbl., a decrease of five percent from May of last year.

Loaded sand barge sinks

A FULLY LOADED SAND barge bound for East Liverpool, Ohio, sank in the Ohio river after ramming a sand bar. One of seven being towed for the Iron City Sand and Gravel Co. of Pittsburgh, it sank in 30 sec. after water reached the gunwale, carrying 400 tons of sand to the bottom. Salvage crews planned to raise it with its cargo and take it to the company's docks for unloading.

Turkey switches to concrete

CONCRETE HAS BECOME the principal building material in Turkey. Within three years production has advanced from 350,000 tons of cement annually to 1,450,000 and there is still a shortage, according to the Turkish information office. The stucco and brick buildings so typical of the Mediterranean are being rapidly replaced in the larger cities by concrete structures.

(Continued on page 60)

You can't set your sights too high

For digging . . . for handling material . . . for any clamshell work — OWEN Buckets perform giant size jobs day in and day out. OWEN'S designing and engineering experience, gained through 50 years of manufacturing Clamshell Buckets exclusively, has developed a product that is guaranteed to out-perform any other make. Remember — the bucket is the working end of the boom and it is of the utmost importance that there is absolute assurance the bucket will do the job.

This experienced "know-how" in design and engineering has contributed to the origination of the only independent tine action Grapple to handle rock, scrap metal or pulpwood. The same unequaled quality construction in OWEN Clamshell Buckets is in OWEN Grapples.



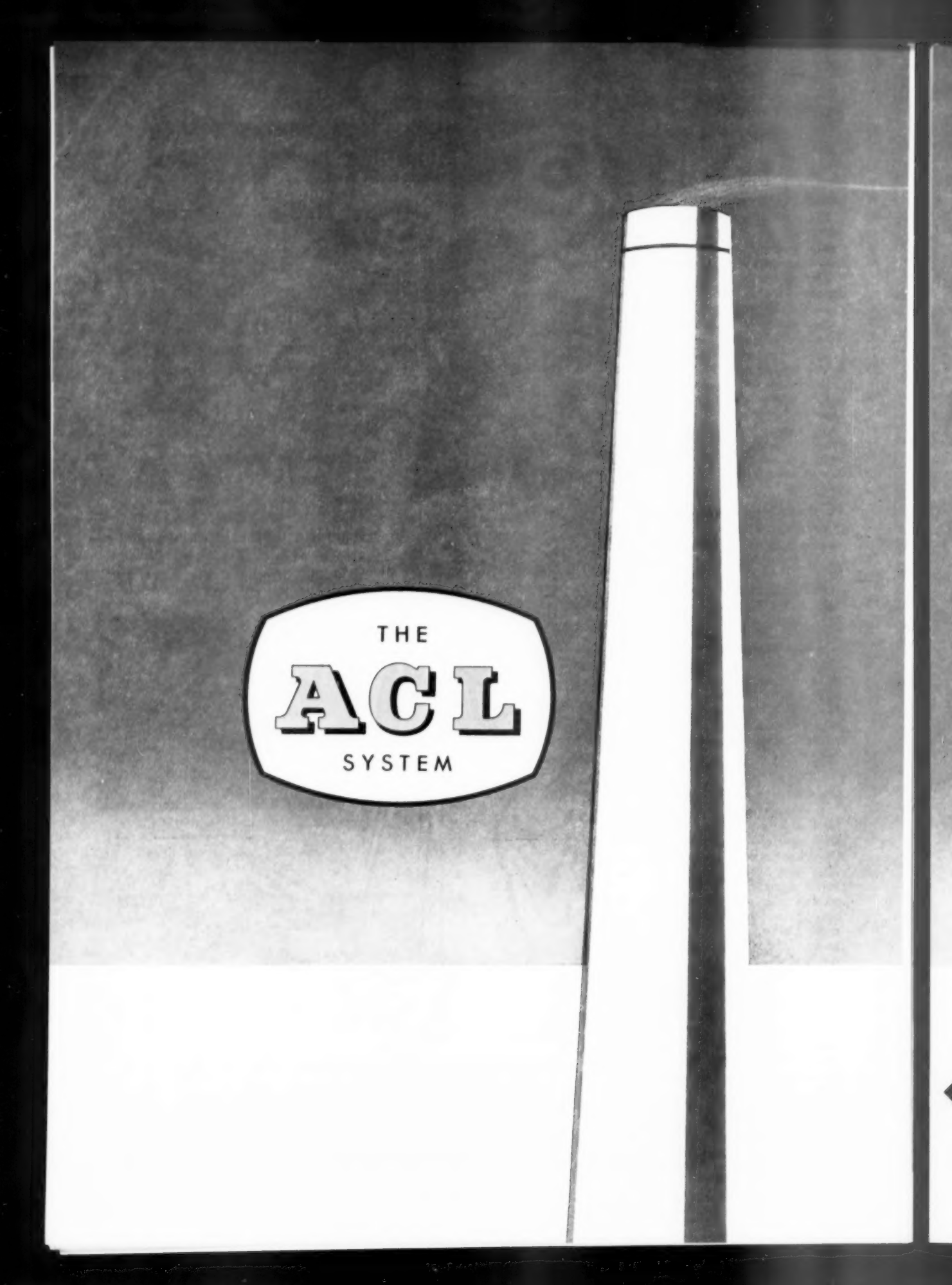
OWEN Engineers are at your service any time at no cost to you. Send us your needs, stating exactly what are your requirements. We should have the answer that will "fit the bill to a T".

The OWEN BUCKET Co.

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Berkeley, Calif. • Fort Lauderdale, Fla.

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THE
ACL
SYSTEM

CLEAN

Stack discharge is merely a wisp ...with ACL System

The introduction of the *ACL* kiln clinkering system marks a bright new era . . . an entirely new concept of *cleanliness* in cement making. This modern cement-burning method is so clean that a plant has been built in the heart of a large city. With a stack discharge aptly described as "merely a wisp," the *ACL* System has no trouble meeting the most stringent air pollution codes.

But cleanliness is just one of the many advantages of the *ACL* System. Maximum burning efficiency, reclamation of material, fuel economy, power savings, conservation of space — all these benefits are yours when you utilize the *ACL* System in coping with the challenge of more cement . . . better cement at lowest cost.

For complete information see your nearby Allis-Chalmers representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. Ask for Bulletin 07B8431.

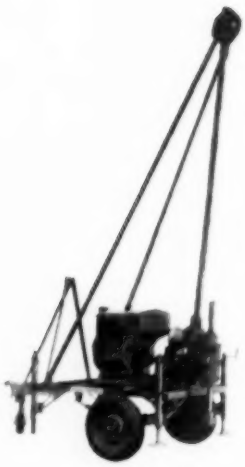
ACL is an Allis-Chalmers trademark.

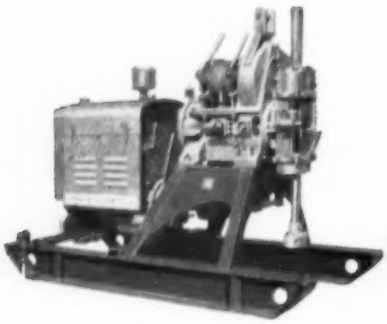
A-C ALLIS CHALMERS

A-5448

ALLIS-CHALMERS

WE HAVE A CORE DRILL MACHINE

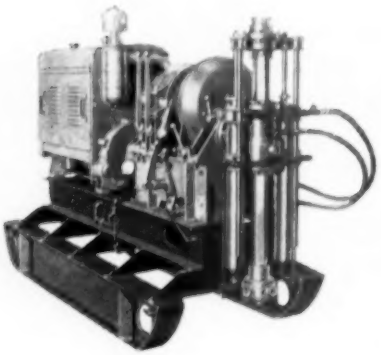




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UP TO 3000 FEET DEEP*

*Depending Upon Size Core Required.



Yes . . . if you need a small one or a heavy one we have just the core drill machine for you. Manufactured by us and used in our own contract drilling department they are made to operate efficiently under the most difficult conditions, giving you the utmost in performance. Write today, giving full details and a descriptive folder on the proper size will be sent. (Skid mounted, trailer mounted, truck mounted.)

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INDUSTRY NEWS

(Continued from page 57)

British Columbia cement merger

DIRECTORS OF EVANS Coleman & Gilley Bros., Ltd., and British Columbia Cement Co. have agreed to plans for a merger. Evans Coleman is a leading distributor of cement and building materials in British Columbia, and the other firm is at present the only cement manufacturer in the province, having an annual capacity of 3,500,000 barrels. It too has a chain of distributors.

If the merger is approved by the companies' stockholders, a newly formed holding company, Ocean Cement and Supplies, Ltd., will control all stock in both firms, which will continue to operate in their present form.

One good firm acquires another

INLAND CEMENT LTD., Edmonton, Canada, has acquired all the assets and assumed the liabilities of the Saskatchewan Cement Corp., Regina. Inland, which is controlled by Belgium's Sogemines Ltd., is acquiring the properties through a wholly owned subsidiary.

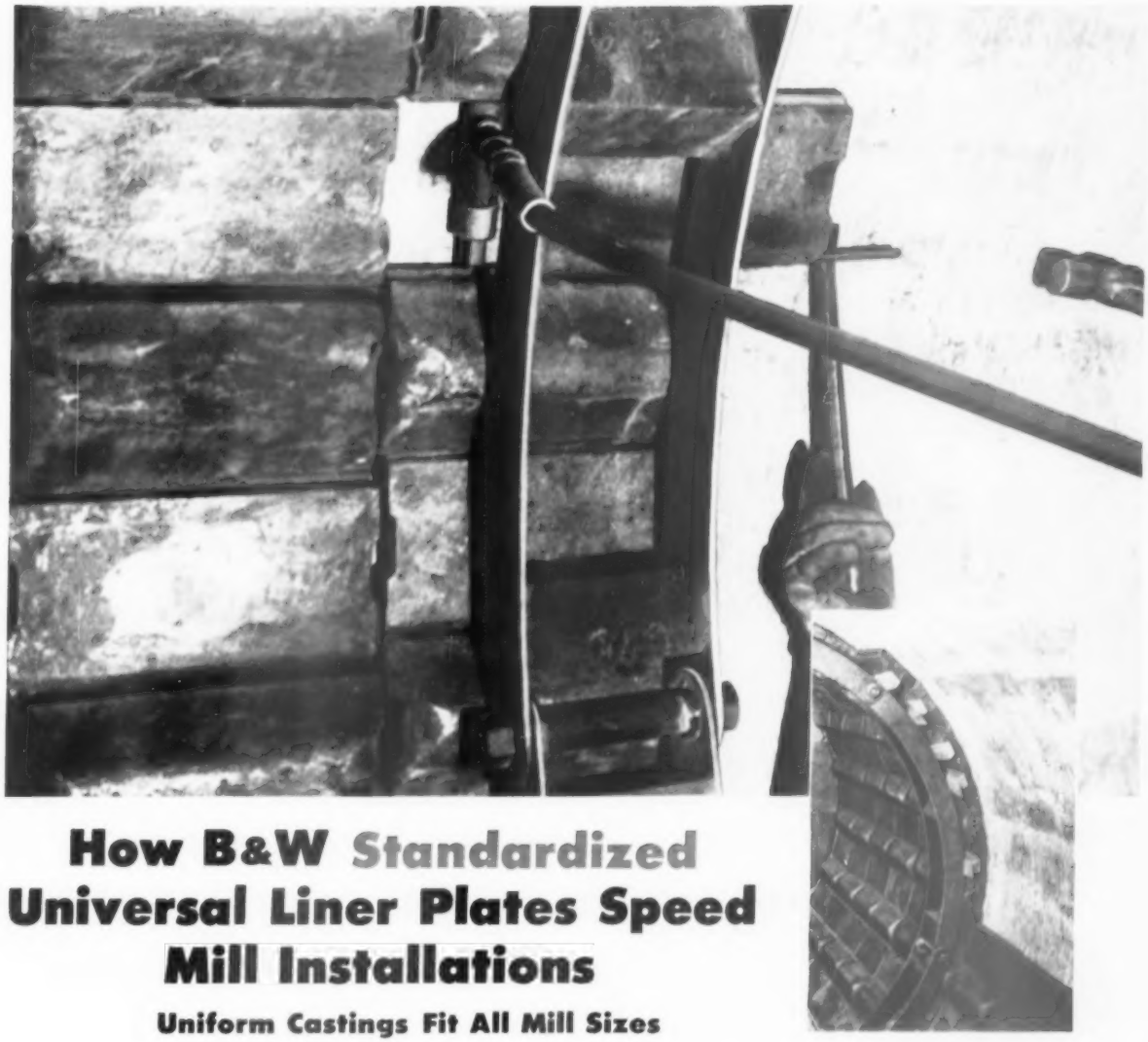
The deal was concluded on a share exchange basis and will give Inland an additional cement making capacity of a million bbl. per year, bringing total annual capacity to 3 million bbl.

Incorporated in 1954, Inland Cement Co. operates a new 2,000,000-bbl. wet-process plant at Edmonton. Saskatchewan Cement has a 1,000,000-bbl. dry-process plant. Inland intends to make capital expenditures at the latter plant to improve operating efficiency rather than to increase production capacity.

Bigger crusher made by Dragon

IT SEEMS WE ERRED. In our June issue on page 107, we referred to a 66 x 86-in. jaw crusher as "the largest machine of its type ever built." We have been informed by a faithful subscriber, Mr. E. C. Blanc, director of Appareils Dragon S. A., Paris, France, that his firm built a 64 x 100-in. crusher for a mine in Lorraine. Our apologies to Mr. Blanc, to his firm, and to France for trying to take her laurels from her. Is it safe to say that the 66 x 86-in. jaw crusher is the largest ever built in the United States?

(Continued on page 63)



How B&W Standardized Universal Liner Plates Speed Mill Installations

Uniform Castings Fit All Mill Sizes

B&W Universal Liner Plates save manhours and reduce mill downtime because they are quick and easy to install. Since the same casting fits all mill sizes, B&W standardization also means lower costs, higher performance, longer life and less breakage in your operations.

Here is the simplified installation procedure:

1. Lay liners in bottom half of the mill with the desired lifter centers.
2. Then, place in position a simple installation form and complete the ring of liners without turning the mill. The last casting in each ring is wedged tightly into place by means of a hydraulic ram and locked with a pin. The joints are designed to permit the use of a spacer pin where needed. The number of pins in a ring depend upon shell variations and lifter centers used.

With B&W Universal Liner Plates, direct labor cost and installation downtime are reduced. Small, lightweight castings are easily handled, minimizing worker fatigue and eliminating the necessity for cranes. Also, B&W Universal Liner Plates give longer life of greater usefulness. Uniform wear results from better quality control on a mass production casting with permanent molds. You save money on liner inventory, breakage claims and delays for replacements. Positive seating of small castings on mill shell means less breakage of castings under operating conditions. Costs are also reduced for storage space since small castings stack easily.

Liners are supplied in two nominal thicknesses, 1½" and 3" with 1½" high lifters. Castings are 6" wide x 12" long. For additional information on B&W Universal Liner Plates, write The Babcock&Wilcox Company, Process Equipment Dept., Barberton, Ohio.

S-472

BABCOCK & WILCOX

BOILER DIVISION

Enter 1511 on Reader Card



These are some of the reasons why H. Gibson Stewart prefers the

CATERPILLAR NO. 955 TRAXCAVATOR*

H. Gibson (Gib) Stewart, Stanhope, N. J., contractor, has nothing but praise for the No. 955 Traxcavator he bought last year. His assistant, David J. Smith, sums up how they feel about it this way:

"What we like best about the No. 955 Traxcavator is that long-life oil clutch and the high loading position. Its digging power is very good, too, and the operator has good visibility and a comfortable seating position. Another important thing is the availability of quick service from our Caterpillar Dealer."

Shown above, the Traxcavator is loading a truck on a hydraulic dredge operation at the Sequine & Bogart Sand and Gravel Pit, Succasunna, N. J. The contract is for the removal and disposal of approximately 4 ft. of hardpan and topsoil from sand. With this CAT* No. 955 Traxcavator under him, the operator has loaded as many as 100 trucks in one day.

Glowing reports of more lift, faster lift and more production per pound of machine continue to come in from owners of these rugged, hard-working excavator-loaders. The complete Traxcavator line consists of the No. 933, 50 HP, 1 cu. yd. bucket; the No. 955, 70 HP, 1½ cu. yd.; and the No. 977, 100 HP, 2¼ cu. yd. A wide variety of buckets and attachments are available for these unit-built machines.

Get the full story from your nearby Caterpillar Dealer. He'll give you the *facts* and a demonstration on *your* job to help you make your decision. After you buy, you can depend on him for good, prompt service and parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

WANTED—
THE HARD WORK

(Continued from page 60)

Kaiser plant production up

THE KAISER CHEMICALS plant at Moss Landing, California, which mines the waters of Monterey bay for magnesia, has completed enlarging its capacity, part of a $3 million expansion program by the firm. Two plants at Moss Landing and a third near Salinas shared in the expansion program, which increased production 150 percent.

Dolomite is quarried and broken up at the Natividad plant near Salinas, processed through kilns and trucked to Moss Landing. Here it is mixed with treated sea water piped in from Monterey bay. The resulting product is an almost pure form of milk of magnesia, which is thickened and mixed in dry form with high grade chrome ore to make refractory brick. Besides adding two large tanks for treating seawater, a new settling tank and dust collection equipment, Kaiser has brought in a rotary kiln with a capacity of 150 tons of magnesia products a day.

Bureau of Mines issues safety awards

THE DEPARTMENT of the Interior has announced that top honors have been awarded six mines and quarries in Alabama, Pennsylvania, Michigan and Minnesota for the best safety records in their groups during the Bureau of Mines' 32nd National Safety Competition.

Of the 525 mineral-producing operations in 43 states competing in the 1956 contest, 200 went through the year without a disabling injury. In the nonmetallic underground mines division top honors went to The Warner Company's Bell limestone mine, Bellefonte, Pa., which worked 277,540 man-hours without a disabling injury. An entrant in the contest every year since it started, the Bell mine has received a previous trophy, in the 1955 contest, and won honorable mention six times—in 1925, 1931, 1932, 1937, 1951 and 1954.

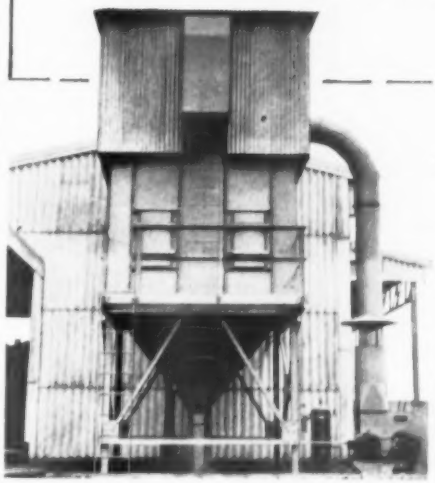
In the quarries division, Alpena limestone quarry, Wyandotte Chemicals Corp., Alpena, Michigan, won with a record of 474,228 man-hours without a disabling injury. The Alpena quarry has been enrolled in the National Safety Competition for 16 of the 32 years, winning in 1943 and 1953, and gaining honorable mention in 1951.

The competition winners were given

(Continued on page 68)

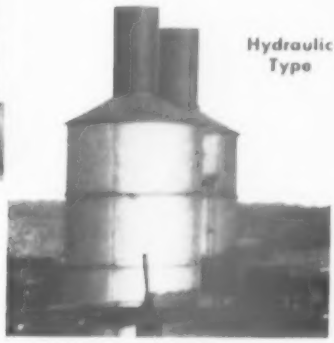
Make your air come clean!

Give Norblo the job of fitting one or more modern types of Collecting Systems to your Dust or Fume problems



Automatic Bag Type

Clean air pays dividends —in employee health and comfort, in protection of work in process, and often, to reclaim valuable materials.



Hydraulic Type

Norblo engineers and manufactures the three types of dust collecting equipment illustrated here in actual use. Norblo recommends the type or combination of types that will give you the best results at most economical cost.

High recovery at low operating and maintenance costs is assured by Norblo engineering and guaranteed performance . . . If you have a dust or fume problem, it pays you to consult Norblo.



Centrifugal Type

The Northern Blower Company

6408 Barberton Ave., Cleveland 2, Ohio • OLympic 1-1300

Norblo ENGINEERED DUST COLLECTION SYSTEMS FOR ALL INDUSTRIES

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New specialized off-highway V-8

Another reason why you'll find International Trucks cost least to own!

A new six-wheeler designed exclusively by INTERNATIONAL for heavy-duty off-highway work—with the most powerful truck-type engine in any comparable truck. Tough, husky construction to perform profitably under the most rugged conditions!

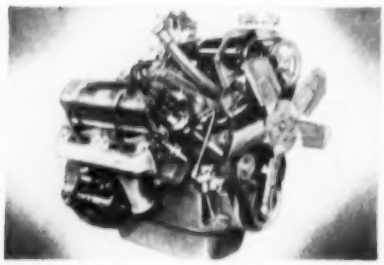
Here is more evidence of the INTERNATIONAL policy to build the trucks that operators want and need . . . trucks with only the highest quality components, the biggest selection of components to stay on the job longer at *least* cost. And INTERNATIONAL Trucks do cost *least* to own—fleet owners' cost records prove* this.

Why not get proof yourself? See or call your INTERNATIONAL Dealer for all the facts. Do it today.

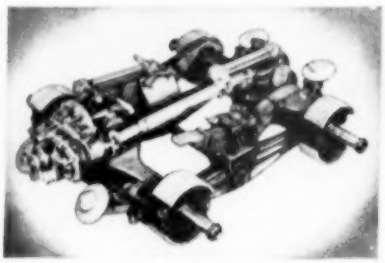
**Signed statements in our files, from fleet owners throughout the U.S., back up this statement.*

INTERNATIONAL HARVESTER COMPANY, CHICAGO

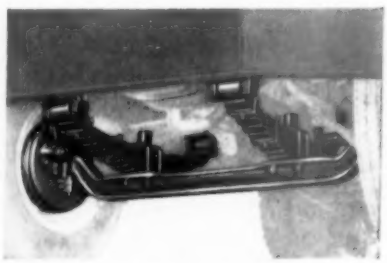
Motor Trucks • Crawler Tractors
Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors



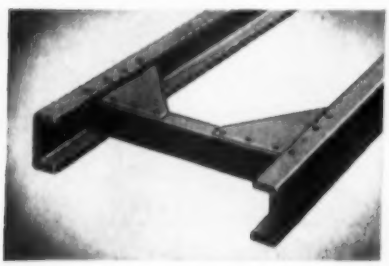
1 Most V-8 power in any truck, 257 hp. New Heavy-duty VF-230 models have load-moving ability unlimited, power to haul the biggest loads. Other six-wheeler engines include sixes and new V-8's—gasoline, LPG and diesels up to 356 hp.



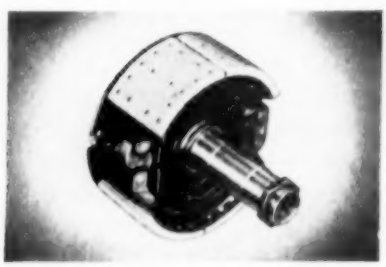
2 INTERNATIONAL tandems give longer, more dependable life. This heavy-duty, **double reduction unit has** 50,000 lbs. capacity. Sturdy cast steel housings. Third differential with lock transmits power smoothly and evenly to each axle.



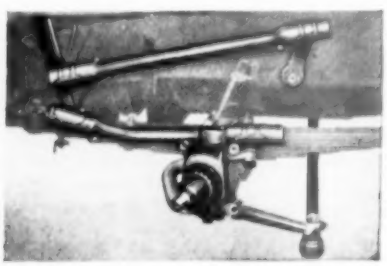
3 Balanced heavy-duty front end for maximum loading, added stability and **longer life.** 15,000 lbs. capacity heat-treated high carbon steel axle, 4-inch wide springs, threaded pins and bushings. Built to take the big jobs in stride.



4 INTERNATIONAL steel-flex frames combine great strength with proper flexibility. **New models have deep, double channels made of heat-treated alloy steel. Reinforced cross-members with husky gussets for sturdy, lasting tandem suspension.**



5 Efficient, fast-acting air brakes are standard on Heavy-duty VF-230—17½ in. x 3 in. front, 16½ in. x 7 in. rear with 1,162 sq. in. total lining area. Other six-wheel models with brake types and sizes to match load and operation *exactly*.



6 True geometric steering provides easier handling and outstanding maneuverability. Heavy-duty gears are cam and roller-mounted twin lever type. Controls mounted *ahead* of the front axle. Power steering standard on this new model.



Latest addition to the world's most popular line of six-wheel trucks—new INTERNATIONAL Heavy-duty VF-230 with 60,000 lbs. GVW. Built to absorb severe shock loads, to stand up under the most extreme applications. Engine is the industry's most powerful V-8, 257 *hp.* Other new off-highway V-8 six-wheelers available, plus models from 22,000 to 76,800 lbs. GVW in conventional and COE design. Complete selection of all-wheel-drive models, too.



7 Heavy-duty, functional construction. Fenders are 12 gauge diamond tread steel plate, welded and reinforced for extra strength and long life. Massive, sturdy bumpers and guards. Rugged reinforced support for front tow pin.



8 INTERNATIONAL also offers a complete line of all-wheel drive models for the tough, off-highway operations. Completely factory-built, 7,000 to 43,000 lbs. GVW. Low height with ample ground clearance. Complete selection of equipment available.



9 World's most complete line. There is an INTERNATIONAL "tailor-made" for *every* job, half-tonners to 96,000 pounders. Choice of 4-wheel, 6-wheel and all-wheel-drive models, conventional and COE design. Every one built to cost *least* to own!

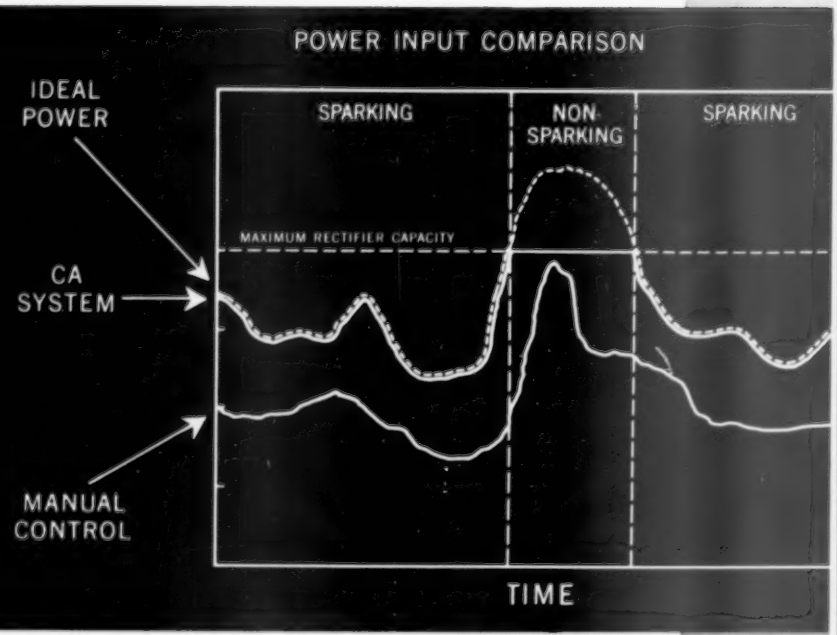
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RESEARCH-COTTRELL'S

New CA System brings Auto

to precipitators

Higher "around-the-clock" collection efficiency without any manual adjustments. That sums up the major advantages of Research's new Cottrell Automation System.



The chart at the left shows how the CA System provides these advantages. As you know, ideal electrical power input to a precipitator is not constant. It varies with changes in gas composition, temperature, rate of flow and humidity, as well as characteristics of the dust, such as size, electrical resistivity and extent of build-up on the electrodes. With conventional controls, manual adjustments cannot keep pace with these changing conditions. This difference between *ideal* electrical power and *actual* power input, under manual control, is shown in the chart. This

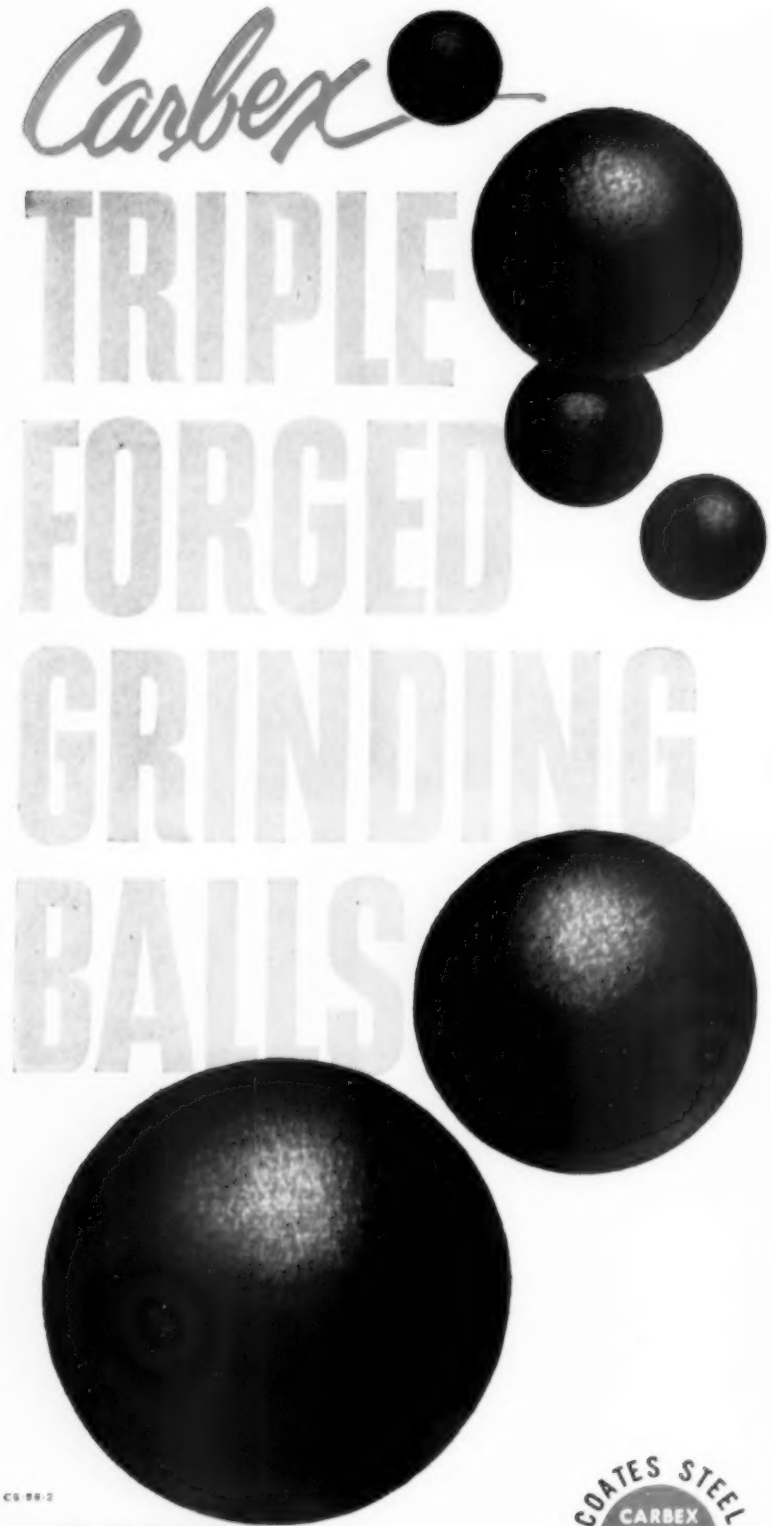
mation

difference means lower collection efficiency. The fast acting electronic circuits of the CA System provide the best practical approach to ideal electrical power. During periods of sparking, electrical power input is controlled by the optimum sparking rate, which can be easily pre-set to any value between 0 and 500 sparks per minute. Under some conditions power input would have to be increased beyond the capacity of the electrical equipment in order to maintain this optimum sparking rate. During such periods the power input is governed by the *capacity* of the electrical equipment. This condition is shown in the center vertical section of the chart.

For more information on this new automation development write for your copy of Bulletin CA. It has a detailed description of how the Cottrell Automation System works and how higher "around-the-clock" collection efficiencies and lower operating costs are obtained.

Research-Cottrell

RESEARCH-COTTRELL, INC., Main Office and Plant: Bound Brook, New Jersey • 405 Lexington Ave., New York 17, N. Y. Grant Building, Pittsburgh 19, Penna. • 228 No. La Salle St., Chicago 1, Ill. • 58 Sutter Street, San Francisco 4, Cal.



CG 88-2

COATES STEEL PRODUCTS CO.

GREENVILLE, ILLINOIS

COATES STEEL PRODUCTS CO. CARBEX TRIPLE-FORGED BALLS

LARGEST EXCLUSIVE MANUFACTURER OF GRINDING MEDIA

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INDUSTRY NEWS

(Continued from page 67)

bronze "Sentinels of Safety" trophies donated by *Explosives Engineer Magazine* and a green and white flag, which they may keep for a year and then yield to the next winner. Each employe and official at the winning operations received a Certificate of Accomplishment in Safety from the Bureau of Mines.

The Bureau also awarded Certificates of Achievement in Safety to the 164 mines and quarries that were second, third, fourth and fifth, and to all injury-free operations that worked 30,000 or more man-hours during the contest year.

New cement plant opens in Indonesia

ASIA'S MOST MODERN cement plant was formally dedicated August 7th by President Sukarno in East Java. In his speech, the president of Indonesia thanked the United States for financial and technical cooperation in building the Gresik works. The plant, with a capacity of 250,000 tpy., is expected to make a major contribution in helping strengthen Indonesia's economy and spur new industries. Cement experts said the plant, which will turn out about 75,000 tons more than present yearly total production of the country, is expected to save Indonesia about $7,000 a day in foreign exchange.

Cement firms hold line against inflation

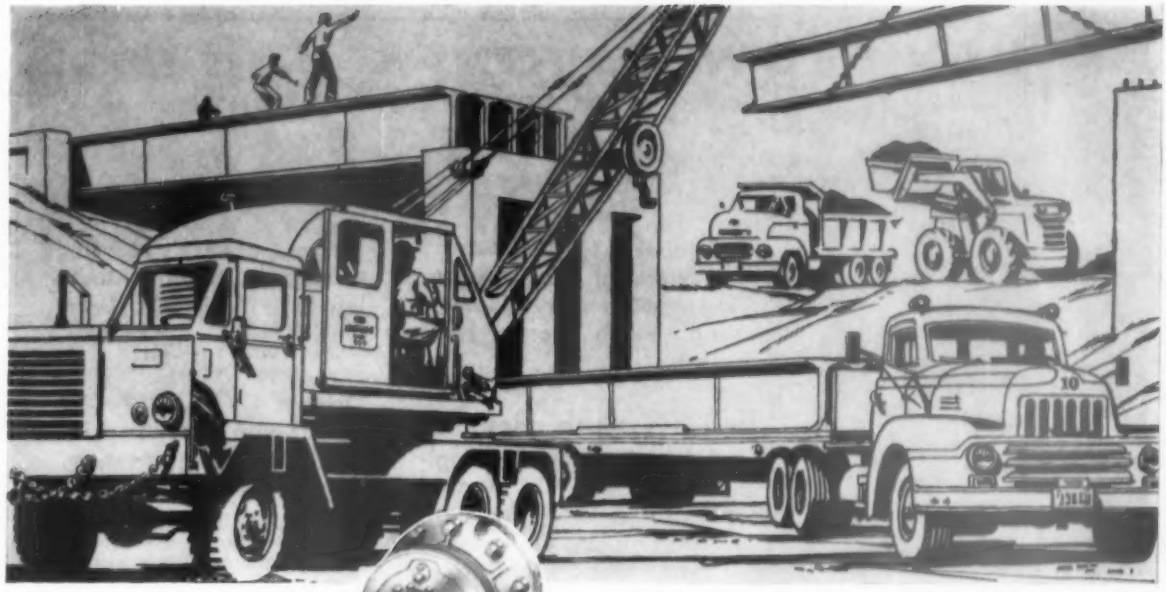
UNIVERSAL ATLAS CEMENT CO. has announced that it is not raising mill prices at any of its eleven plants serving the areas east of the Rockies and the south for the rest of the year.

Unchanged fourth-quarter quotations were also issued by Alpha Portland Cement Co. and Lehigh Portland Cement Co. for many areas. According to the president of Lone Star Cement Corp., H. A. Sawyer, this makes it unlikely mill prices of cement will rise this year in most areas of the nation.

Prices cut by one firm

ARIZONA PORTLAND CEMENT CO., Rillito, Ariz., a wholly owned subsidiary of California Portland Cement Co., has cut cement prices in an anti-inflation move. Ernest E. Duque, president of Arizona Portland, said his firm was cutting its price 15 cents a barrel to $3.05 at the mill. He cited the need to halt "wage-price inflation spirals" by voluntary steps on the part of business and labor.

(Continued on page 70)





Check the amazing performance records set by this unique

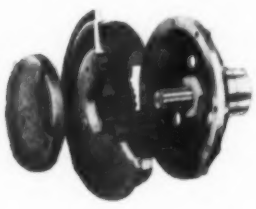
CLARK Planetary Axle

ideal final drive for

• Excavator-cranes and other heavy-duty industrial machines • Tractor Shovels, Bulldozers and similar construction equipment • Tandem Drive Units in all applications.



Primary Reduction in the center section, by helical bevel pinion and gear.



Second Reduction in the drive wheel —a sun gear splined to the axle shaft and three planet gears driving an internal gear in the inner periphery of the wheel, as close as possible to the point where tractive effort is applied.

Two types: steering and non-steering.

You've never, in all probability, seen anything quite like this extraordinary performer, for the reason that there isn't anything just like it.

Look at this record of the Clark Planetary Axle—

• 70% LESS TORQUE LOAD ON SHAFTS —planetary drive assembly takes 70 per cent of the torque load off the axle shafts. Result: shaft wind-up and surge are practically eliminated—and *broken shafts are virtually unknown.*

• LIGHTER WEIGHT—YET STRONGER—severest torque loads are handled easily by shafts and gears actually smaller in size and therefore considerably lighter in weight than other axles of equal capacity.

• ROAD SPEEDS UP TO 30 MPH—big time-savings in job-to-job travel.

Important: A number of operators, faced with difficult hauling conditions, have converted equipment of conventional type by installing Clark planetary axles—with remarkable success.

Doesn't it make complete good sense to find out about this remarkable piece of equipment—and how it may solve your problem? The coupon will get you prompt delivery of full information.

CLARK EQUIPMENT COMPANY • AXLE DIVISION, Buchanan 10, Michigan

CLARK® EQUIPMENT

Please send illustrated bulletin on the Clark Planetary Axle.

Name_____ Position_____

Firm_____

Address_____

City_____ State_____

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(Continued from page 68)



Indian rotary kiln sets run record

ASSOCIATED CEMENT COMPANIES, Bombay, India, has announced that the No. 4 kiln at its Kymore plant recently completed a total uninterrupted run of 612 days, which is a record for India and perhaps a world record, considering that the refractory lining consisted of only 45 to 50 percent alumina brick. The kiln was fabricated in the firm's central workshop at Shahabad in 1948 and put into commission in January 1949. During the run total clinker production was 189,980 long tons. The kiln is a wet process rotary unit using pulverized coal for fuel.

The Associated Cement Companies is the largest cement producer in India, with 15 factories there and two in Pakistan. Total production is over 3,250,000 tons per year.

Aggregate company to open cement plant

THE COLONIAL SAND & STONE CO., Inc., has announced plans to enter the cement manufacturing field with a new plant at Kingston, N.Y. The company has acquired about 30 acres at Kingston containing substantial limestone deposits. Initial capacity is to be 2,500 bbl. per day. The Hudson Cement Co., a wholly owned subsidiary, will operate the plant when it opens next year.

Germans rank third in cement production

OUT OF AN ESTIMATED 229,800,000 tons of cement produced in the world in 1956, Germany's 19,660,000 placed third in the world—ranking behind the U. S. with 53,300,000 and the U.S.S.R. with 24,900,000. Canada produced 4,690,000.

(Continued on page 73)

Coming Conventions

1957

October 9-11, 1957—
National Slag Association, 40th Annual Meeting, Plaza Hotel, New York, N.Y.

October 15-18, 1957—
Society of Mining Engineers of A.I.M.E., Annual Meeting and Southeastern States Mining Conference, Hotel Hillsboro and Hotel Tampa Terrace, Tampa, Florida

October 16-18, 1957—
National Industrial Sand Association, Fall Meeting, Greenbrier, White Sulphur Springs, W. Va.

October 17-19, 1957—
Empire State Sand, Gravel and Ready Mix Association, Annual Meeting, Lake Placid Club, Lake Placid, N.Y.

October 17-19, 1957—
National Lime Association, Operating Meeting, Commodore Perry Hotel, Austin, Texas

October 21-25, 1957—
National Safety Council, 45th Annual Safety Congress and Exposition, Conrad Hilton, Congress, Morrison and LaSalle Hotels, Chicago, Ill.

October 22-23, 1957—
Cement, Quarry, & Mineral Aggregates Section, National Safety Congress, Chicago, Ill.

1958

January 19-23, 1958—
National Agricultural Limestone Institute, 12th Annual Convention, Hotel Statler, Washington, D.C.

February 10-13, 1958—
National Sand and Gravel Association, 42nd Annual Convention and Exposition, Conrad Hilton Hotel and Chicago Coliseum, Chicago, Ill.

February 10-14, 1958—
American Society for Testing Materials, Committee Week, Hotel Statler, St. Louis, Mo.

February 17-19, 1958—
National Crushed Stone Association, 41st Annual Convention, Conrad Hilton Hotel, Chicago, Ill.

March 5-6, 1958—
Iowa Agricultural Limestone Association, Inc., 13th Annual Convention, Savery Hotel, Des Moines, Iowa

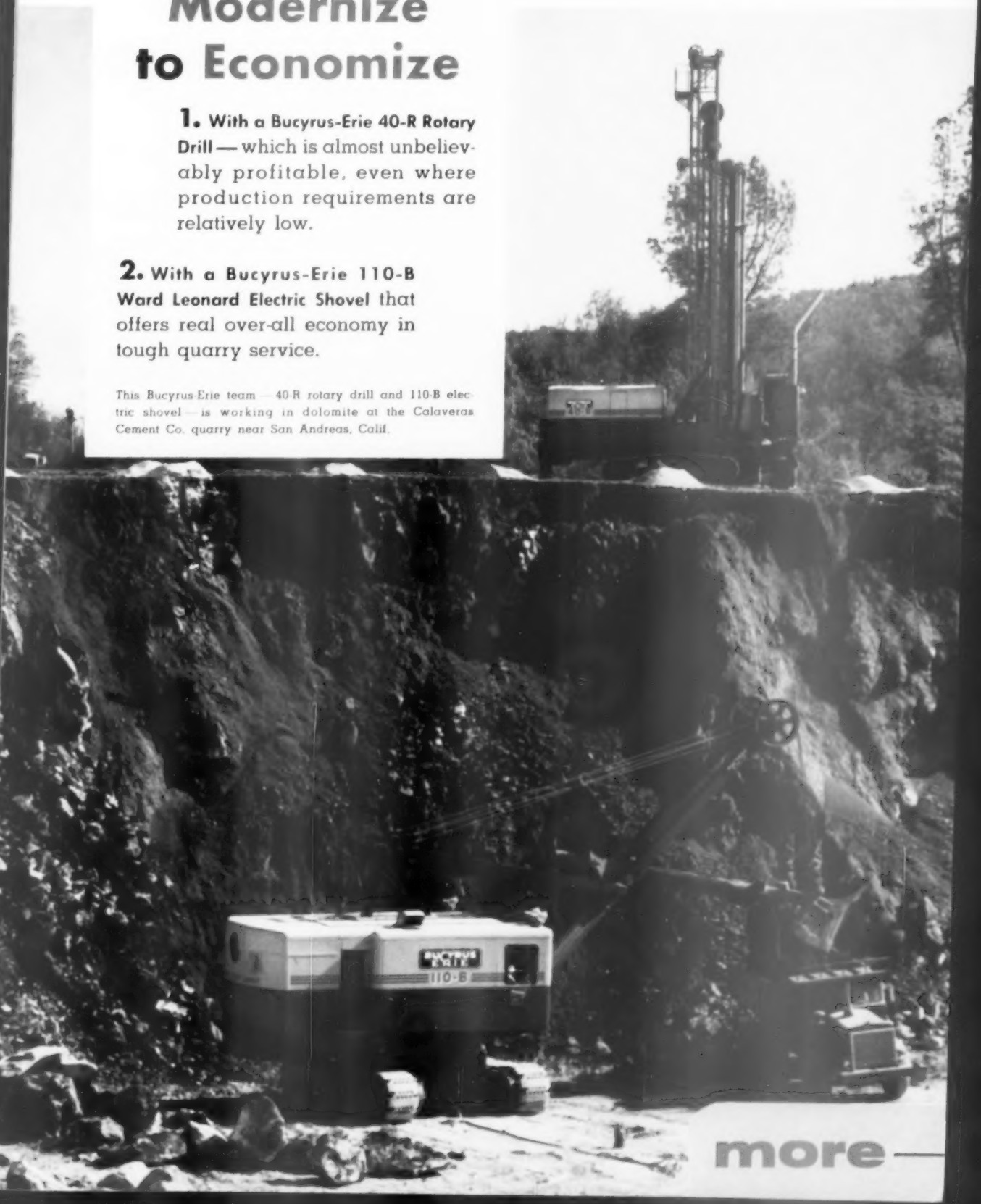
June 22-27, 1958—
American Society for Testing Materials, 61st Annual Meeting and Exhibit, Hotel Statler, Boston, Mass.

Here are 2 proved ways you can Modernize to Economize

1. **With a Bucyrus-Erie 40-R Rotary Drill** — which is almost unbelievably profitable, even where production requirements are relatively low.

2. **With a Bucyrus-Erie 110-B Ward Leonard Electric Shovel** that offers real over-all economy in tough quarry service.

This Bucyrus-Erie team — 40-R rotary drill and 110-B electric shovel — is working in dolomite at the Calaveras Cement Co. quarry near San Andreas, Calif.



more —

...More about 2 proved ways you can Modernize to Economize

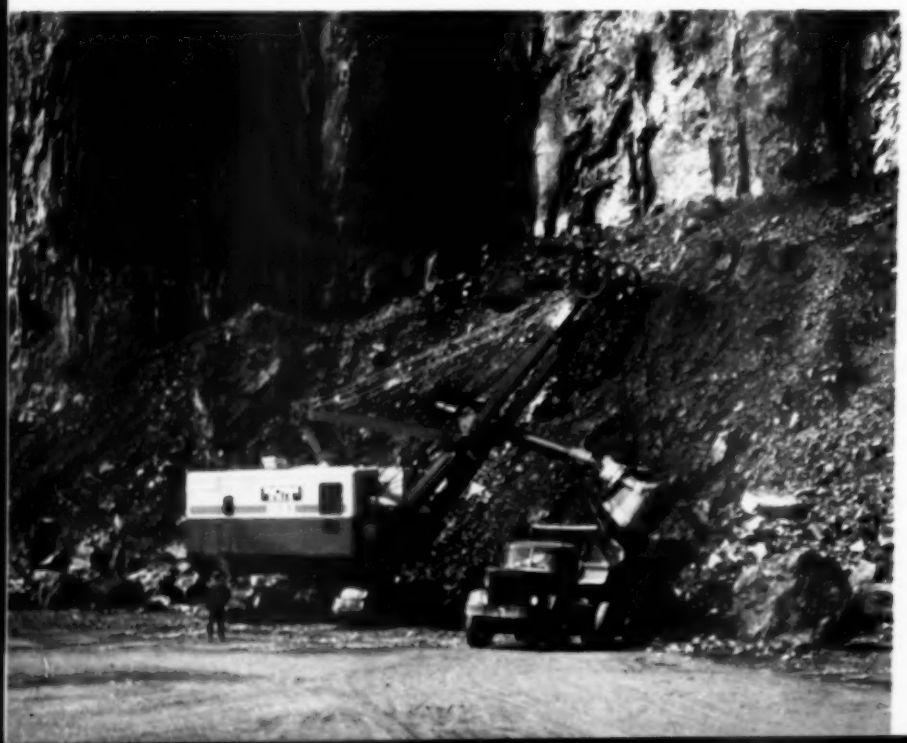
The 40-R Rotary DOES Cut Drilling Costs — in quarry after quarry, with features like these: air bailing cools the bit and cleans out cuttings. Remote-controlled, power-driven drill pipe rack reduces manual effort. Hydraulically powered down pressure on the bit provides controlled load on drilling tools for maximum penetration. Ward Leonard control on rotation of the drill pipe permits drilling at the most efficient speed for a given formation. No wonder those who use them want to convert completely to Bucyrus-Erie rotaries!

Let Us Estimate the Savings to You — Trained Bucyrus-Erie men will study your operations and show you how you can use the 40-R to effect real cost savings — *even with relatively low production requirements.* You have nothing to lose — and much to gain — by letting us *prove* what the 40-R will save you.

The 110-B Ward Leonard Electric Shovel has been known as a low-cost performer wherever it is used — particularly on jobs involving big yardages, or extra tough materials or conditions. It is not a "stretched" machine. It was designed from the ground up to handle 4½ yards in tough going. The outstanding performance of the one shown here loading trap rock in New Jersey made the owner a repeat buyer.

Give Us an Opportunity to Explain Its Savings. We would like to show you production and cost figures which tell best how the 110-B performs and how it saves money.

A Bucyrus-Erie 110-B 4½-yd. electric shovel loads trap rock.





This Bucyrus-Erie 40-R rotary drills 9-in. hole in dolomite.

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Bankers Building FRanklin 2-5321

Pittsburgh, Pennsylvania
2 Gateway Center ATlantic 1-4815

Atlanta, Georgia
William-Oliver Building JAckson 3-8446

Kansas City, Missouri
Esplanade Building VAlentine 1-6281

Dallas, Texas
Tower Petroleum Bldg. RIverside 1-4965

South San Francisco, California
120 Freeway Street PLaza 5-7436

Los Angeles, California
Security Title Ins. Bldg. MIchigan 9642

Seattle, Washington
White-Henry-Stuart Bldg. MAine 6424

Hibbing, Minnesota
1226 16th Ave., East AMherst 3-7503

IN CANADA
Bucyrus-Erie Co. of Canada, Ltd.
Toronto, Ontario
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BUCYRUS ERIE

A Familiar Sign at Scenes of Progress

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

(Continued from page 70)

Rock company receives insurance safety award

THE STATE INSURANCE FUND, largest carrier of compensation insurance in New York, gave a special citation to employes of the Tomkins Cove quarry of New York Trap Rock Corp. for their recent outstanding achievement in the field of industrial safety.

In July, men at the plant completed 500,000 man-hours on the job without a lost-time accident. "This is truly a remarkable record for men in the quarrying industry, as well as for workers in all industries," said William B. Folger, executive director of the State Insurance Fund.

At the ceremony in August during which a plaque was presented to the employes by Mr. Folger, New York Trap Rock announced its plan to double the size of cash incentive safety awards to plants reaching the half-million man-hour level. Formerly the company awarded $1,000 to plants on completion of each accident-free 100,000 man-hour period. Now, plants reaching the 500,000-hour mark receive $2,000, and are given an additional $2,000 for each consecutive 100,000-hour period thereafter. The plan covers about 560 employes.

John Jorgensen, Tomkins Cove plant superintendent, was commended for his contribution to the record. Company safety director Seymour Fleming noted that such an achievement would be virtually impossible without the aid supplied by Mr. Jorgensen in establishing safe working conditions and procedures in the plant.

French firm to open Vancouver cement plant

LAFARGE CEMENT of North America Ltd. is building a portland cement plant on Lulu Island, 14 miles from Vancouver, British Columbia, and will be in operation by March 1, 1958. A subsidiary of Societé Anonyme des Chaux et Ciments de Lafarge et du Teil of Paris, France, the plant will produce 1,500,000 bbls. per year.

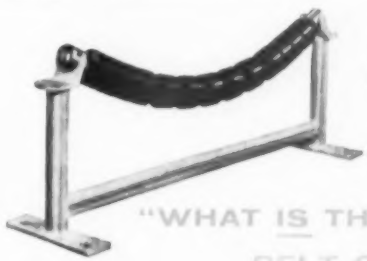
Cement will be produced by the wet process. The plant is to have one 450-ft. rotary kiln, equipped to burn natural gas or oil, and two grinding units, one on the raw side and one on the finish side. Shipping facilities will be provided on the island so finished cement can go out by truck, rail or barge. Limestone will be brought from the firm's quarry on Texada Island, about 70 miles away.

END



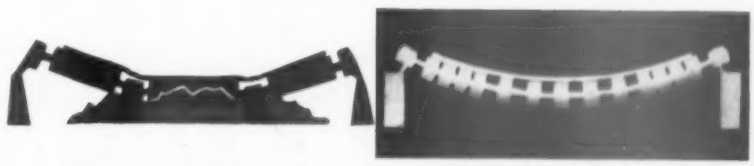
Texans report big production with crushing setup

HENRY L. STAFFORD, Lubbock, Texas, has reported averaging a production of 547 cu. yd. per hour on a recent 12-hr. continuous operation at his crushing plant near Canyon, Texas. The Stafford plant achieved this 6,564 cu. yd. total daily output using a new Cedarapids 3645 portable double impeller, impact primary crusher, pictured on the job.

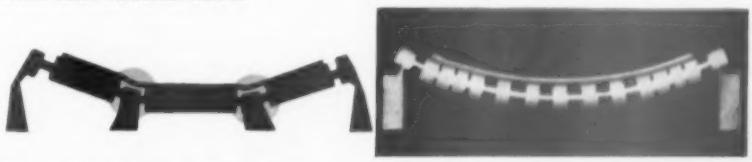


We've been asked...

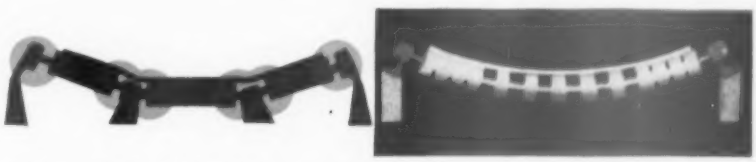
"WHAT IS THE JOY LIMBEROLLER BELT CONVEYOR IDLER?"



Radically different from all other idlers, the Limberoller is a flexible steel cable suspended between two bearings . . . neoprene discs are molded to the cable . . . forming a single roll idler which turns on its own axis. This imparts a flexing action which is self-cleaning . . . prevents material buildup, a source of trouble with conventional idlers.



Supports the belt throughout its entire width . . . doesn't have the unsupported gaps left between the rolls like conventional idlers. Increases belt life 20% and more. Materials don't "bump along" from idler to idler, either.



Two bearings, instead of six. They are up out of the dirt zone, not hiding down under the belt. Joy has never replaced a single bearing due to normal failure. Heard enough? There's more . . . get the whole story from ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

JOY . . . EQUIPMENT FOR ALL INDUSTRY

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Now! from Thermoid —



THUNDERBIRD
WIRE BRAID AIR HOSE

Take the most severe heavy duty use you have for hose. Put Thermoid Thunderbird Wire Braid Hose to work. You'll agree, for brute service, this light, extremely flexible hose is the most durable, economical you've ever used!

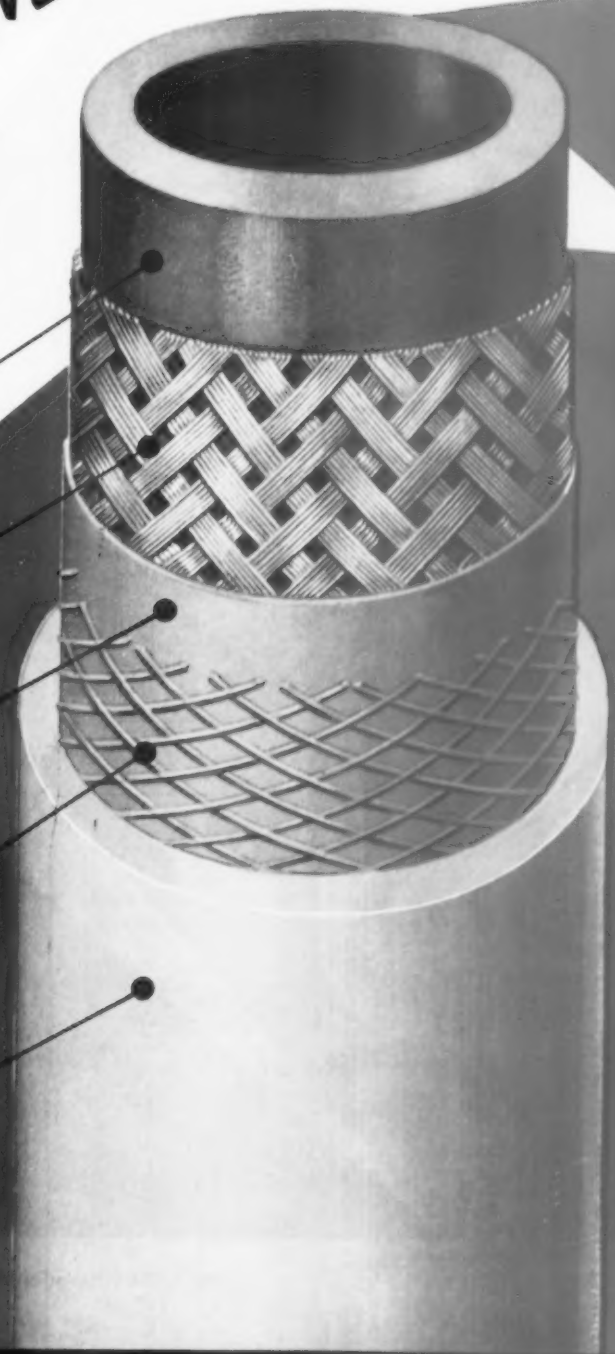
Thunderbird's heavy Neoprene tube withstands hot or cold oil—won't flake or swell. Its high tensile steel wire braid prevents bursting from the roughest kind of outside impact—stands many times the maximum working pressure from within. Accurately controlled angle of the braid provides great flexibility. The tough rubber cover gives maximum resistance to abrasion. Its light gray cover makes it easily visible.

Thunderbird is available in sizes from 3/8" to 4", with working pressures up to 400 psi. air or 2,000 psi. water. Lengths up to 50 feet. Get the full facts now from your nearest Thermoid Distributor, or write direct.

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TOUGHEST, MOST FLEXIBLE HOSE YOU'VE EVER USED!



HEAVY GAUGE, OIL-PROOF NEOPRENE TUBE

FLEXIBLE, HIGH-TENSILE STEEL WIRE BRAID

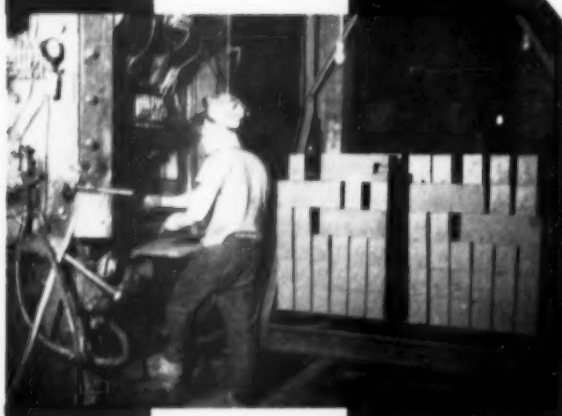
TIE GUM FOR PERMANENT COVER ADHESION

BREAKER PLY OF BRAIDED TEXTILE YARN

RUGGED RUBBER COVER— LIGHT GRAY FOR VISIBILITY

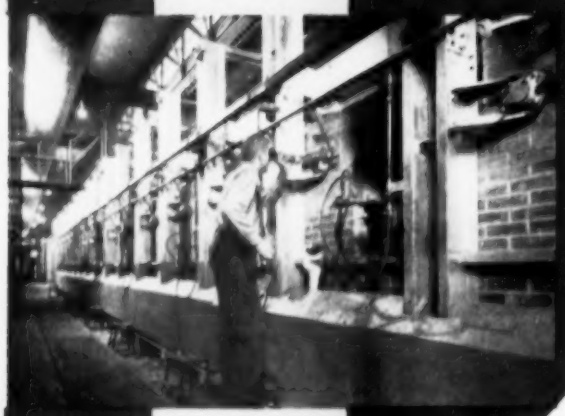
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ROCKY'S NOTES

(Continued from page 17)

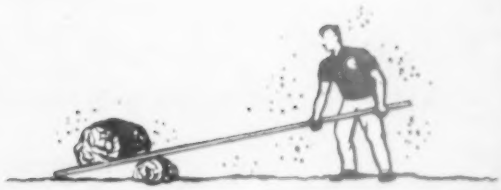
tion in the mass, but also from an increased ability to creep under load and to extend to a greater extent before rupture occurs."

It seems to us that this is putting a finger on one of the reasons why it is desirable to introduce, in some manner, more silica in portland cement. It is the silicate lattice, the network of SiO_2 tetrahedrons, extending in all directions which gives cement concrete the properties mentioned above. Any way to help build up this lattice thus improves the cement. Our authors say: "The presence of pozzolans increases the amount of silica gel ultimately remaining as the bonding constituent and so preserves the concrete (from salt-water attacks). It is well known that silica gel can form an excellent bonding material."

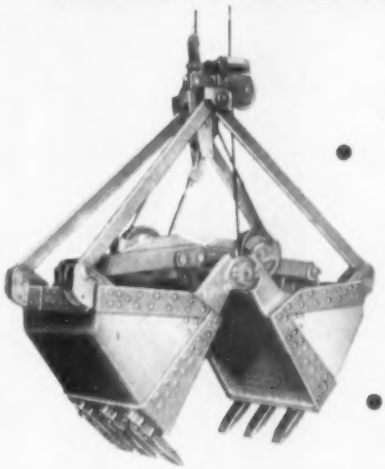
Slag Cements—Ground or granulated blast-furnace slags are used in four different ways to make hydraulic cements: (1) raw material for portland cement by the ordinary processes; (2) blended with portland cement; (3) blended and ground with dead-burned gypsum and cement or lime to make "supersulphated" cements; (4) ground and mixed with hydrated lime. Slag composition varies greatly, with the percentage of lime ranging from 38 to 54, the silica from 28 to 38, the magnesia from less than 2 to 6, etc. Usually, our authors say, the more basic slags are the ones to use because they have the greatest latent cementing properties. However, if the real purpose of the slag is to serve as a pozzolan, we see no reason why a high silica content should be objectionable. There is a continuing controversy going on in this country as to the possible harmfulness of MgO in slags used in cement blends. The maximum MgO permitted in most portland cement specifications is five percent. Present American specifications set the same limit for portland cement blended with granulated slag, which means, of course, that the MgO in slag can not very much exceed five percent, if the cement itself is near that limit.

This point is covered very specifically in the book before us, where it is stated: "Though high magnesia contents have an adverse effect on the hydraulic properties of granulated slags, they do not cause unsoundness as is found in portland cements of high magnesia content. The composition of slags is such that, even when fully

(Continued on page 80)



KIESLER
LEVERAGE.



THE MIGHTY ICE TONG PRINCIPLE

Mighty Ice Tong Principle

Whether you are moving heavy rocks or operating a clam shell bucket, leverage . . . applied correctly . . . is highly important to you. For only with correctly-applied leverage can you expect to get the job done.

That the KIESLER bucket does get the job done is no idle claim: the KIESLER bucket DIGS DEEPER and DUMPS FASTER than any other bucket known!

IT DIGS DEEPER . . . because leverage is applied through two lever arms. Thus, power is EQUALLY exerted to BOTH SHELLS. This digging force, unequalled by any other bucket, is accomplished without unnecessary parts to the line, with less cable, and without extra dead weight.

IT DUMPS FASTER . . . because of the exclusive shell design which, besides providing for a full load, provides for dumping the instant the jaws start to open (not only when they are wide open). This positive dumping angle thus affords the operator spot dumping, avoiding spillage. Handling costs are reduced to a minimum.

DEEPER DIGGING . . . FASTER DUMPING . . . CONSISTENT PERFORMANCE . . . TROUBLE-FREE MAINTENANCE . . . that is the story of the KIESLER CLAM SHELL BUCKET. Phone or write today to learn how a KIESLER bucket can save you time and money in your rehandling jobs.

GUARANTEE
Kiesler Buckets are guaranteed to outperform and do a bigger day's work than any other Bucket of equal weight, width and size, when properly reeved and operated.

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1

Gang-operated disconnect switch isolates starter from incoming power — assures safe entry of high voltage compartments.

2

Steel cubicle is compartmentalized — separates high and low voltage equipment.

3

Short-circuit protection is provided by fast-acting current-limiting fuses, rated 150,000 kva at 2300 volts and 250,000 kva at 4160 or 4600 volts.

4

Overload protection is handled by accurate relays which trip only on excessive motor current, preventing needless motor stoppages.

5

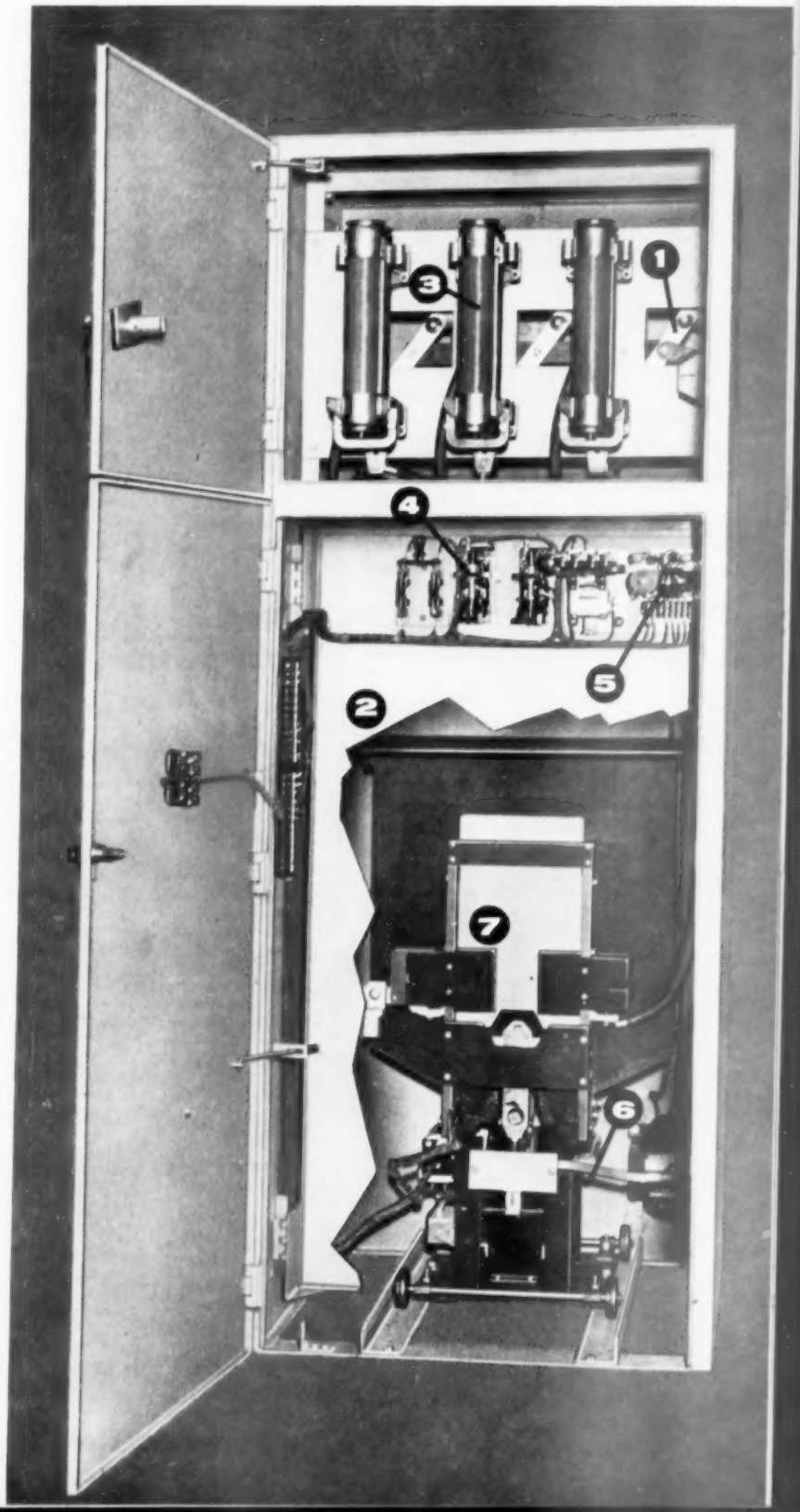
Undervoltage protection instantaneously opens line contactor on loss of voltage. Time-delay undervoltage protection also available.

6

Mechanical interlock coordinates contactor, disconnect switch, upper door and inner control barrier for maximum safety.

7

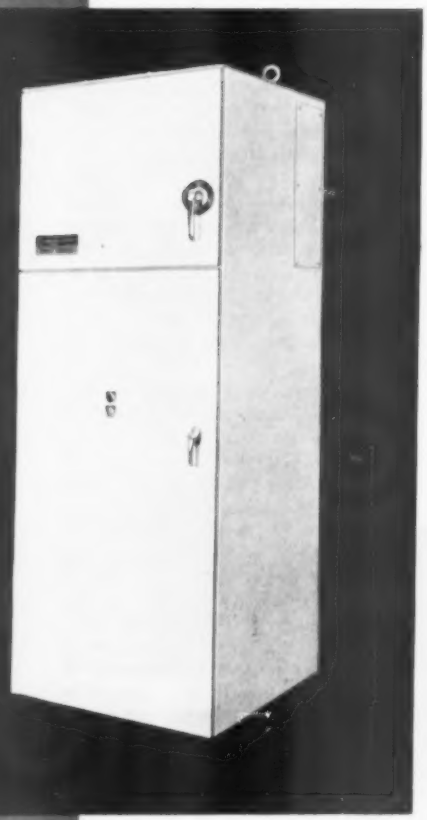
Roll-out contactor makes maintenance easy—even in narrowest aisle space. (Routine inspection and maintenance can be done with contactor in place.)



Designed

Type H High Voltage Motor Control

Combines front access with space economy...

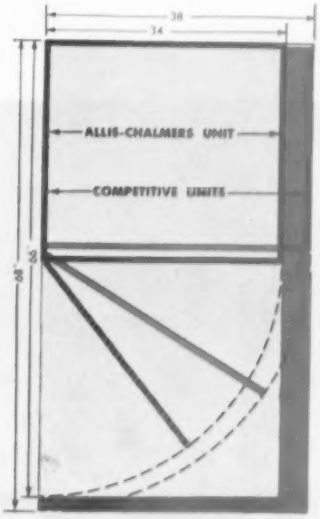


In addition, you get maximum protection for personnel and machines, thoroughly tested components, and ample panel space for modifications. It's all built into the *smaller cabinet* of a newly designed line of Type H high voltage starters from Allis-Chalmers.

Here is control that couples compactness with roominess (for ease of maintenance) . . . here is a starter that joins test-proven performance with versatility (for addition of meters and relays) — AND the line meets every 2300 to 5000-volt motor need.

For more information on this engineering advance, contact your A-C representative or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS UNIT requires 2.3 sq ft less floor space than any competitive unit. Put 10 A-C units in the same area needed for 9 cabinets of other manufacture.



Indicates 2.3-sq-ft saving in floor space

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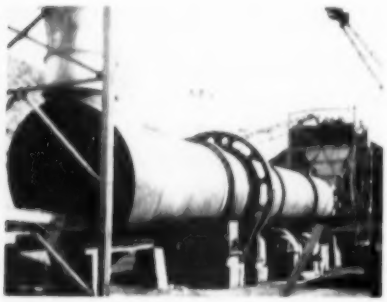
Interior of shell of "XH" Ruggles-Coles Dryer showing lifting flights and feed spirals.

from **Alumina ores** to **Zircon Zconcentrates**

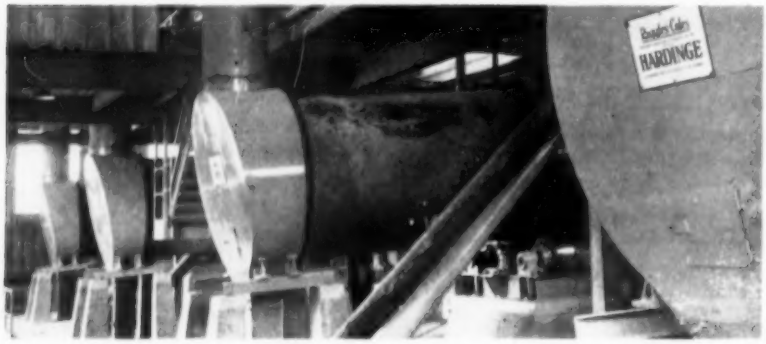
. . . in the drying of ores and concentrates. That is the story of Ruggles-Coles "XH" Dryers.

Small or large, each dryer is designed for the specific requirements of the user with the knowledge and experience gained from hundreds of installations.

Complete specifications upon request. Ruggles-Coles Dryers are described in Bulletin AH-438-7.



10' diameter, 80' long "XH" Ruggles-Coles Dryer drying bauxite in Jamaica.



Four 80" diameter, 60' long "XH" Ruggles-Coles Dryers handling asbestos ore in Canada.

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ROCKY'S NOTES

(Continued from page 77)

crystallized, no free MgO appears until the magnesia content exceeds 24 percent, at least." The text goes on to say that portland blast-furnace cements containing granulated slags with up to 18 percent magnesia content have shown no unsoundness in the ASTM autoclave test, while concretes made with them gained strength in a normal manner up to three years, and showed no indication of dimensional instability. German standard specifications for such cements set no limit on the MgO in the slag.

High Alumina Cement—A chapter of 34 pages is devoted to high alumina cement. Data on this subject are rare in American technical literature, because this kind of quick-hardening cement has been little used in this country. Only one manufacturer here makes it, and its most important market is probably for refractory uses. During the setting and hardening processes, high alumina cement mortar and concrete are very sensitive to temperatures above about 30 deg. C. Under such conditions a different calcium aluminate is formed, which has very little strength as a cement. The authors conclude that experience of the long-age behavior of high alumina cement concrete has been very variable.

Aggregates and Concrete — The chapters on aggregates and concrete refer more especially to British practice and experience. The material on the effects of physical and chemical properties of aggregates on concrete, such as the alkali-silica reaction, is taken largely from familiar American sources. Other countries do not appear to have had as much trouble, perhaps, because as in England, most foreign portland cements are low in alkalies. Our authors' discussion is interesting because it is a digest by experts of various theories and experiences by American researchers, not always in agreement with each other.

The rest of the book is devoted to uses for and properties of concrete under various conditions. Air-entrained concrete is discussed by the authors as interested students of American practice, rather than as all-out advocates, as are so many American writers. It is stated: "Concrete resistant to normal frost exposure can be made without such aid, but air entrainment is obviously beneficial in offsetting adverse conditions and in affording a wider margin of safety."

END

WATCH FOR FIRESTONE WHEN THE HEAVYWEIGHTS ROLL!



Firestone Tubeless Rock Grips are performance champs on big jobs!

Firestone Tubeless Rock Grips knock down operating costs. Two great tread designs match toughness with traction to ward off all the bruising punishment the meanest terrain can dish out. Rock Grips cut down time-wasting tire changes because they're built for *all* types of terrain. You get *full flotation* to stay "on top" in sand and soft stuff, plus super-strong *armored grip* to take punishing runs over broken rock day after day. Safety-Tensioned *Gum-Dipped*® NYLON bodies, combined with cut-resistant treads, make these heavyweight haulers first choice for off-highway users. Your Firestone Sales Engineer will be glad to show you why they'll be your first choice, too. Contact him today through your local Firestone Store or Dealer.



ROCK GRIP WIDE BASE ROCK GRIP

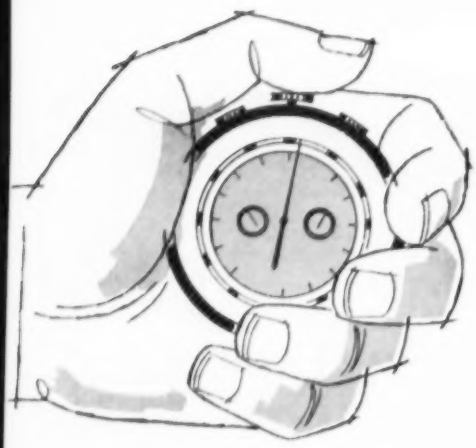
Enjoy the Voice of Firestone on ABC television every Monday evening

Firestone

BETTER RUBBER FROM START TO FINISH

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SECONDS SAVED

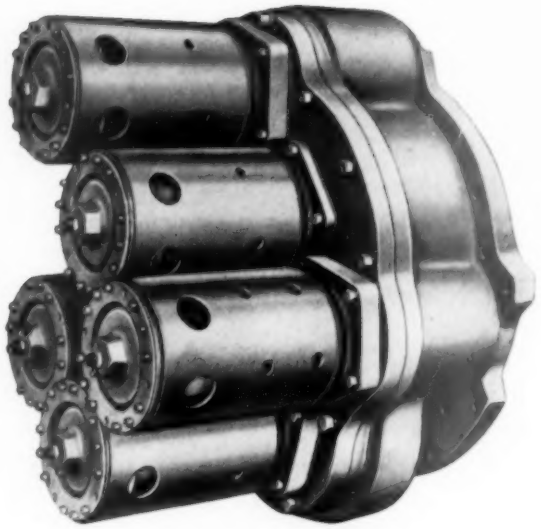
add up fast to give you ...bigger production ...bigger profits

Constant-mesh transmission on Tournatractor® saves shifting time

You can save as much as 80 minutes per 10-hr. day in your pit-tractor operations with instant shifting provided by Tournatractor's constant-mesh transmission.

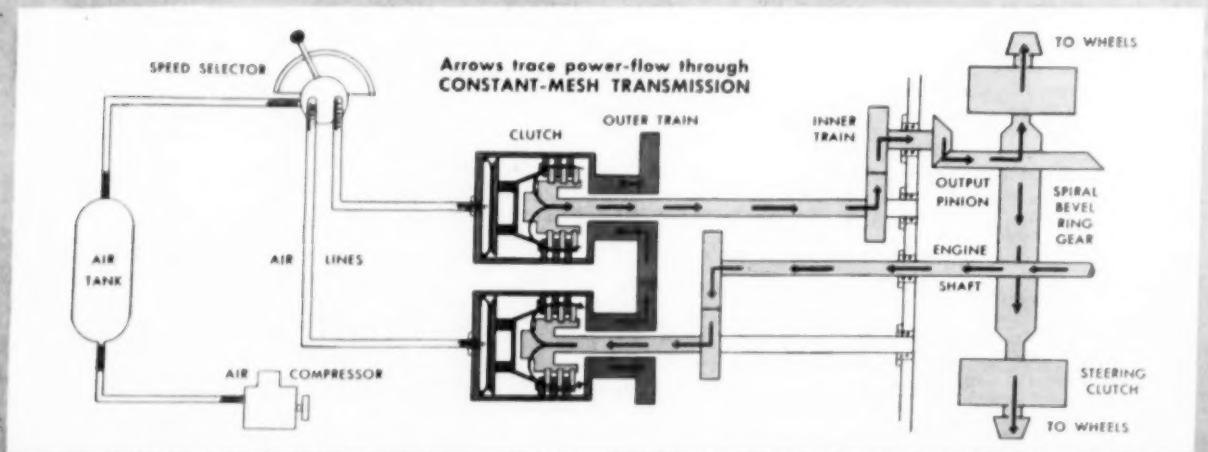
This transmission is operated by air clutches for fast, efficient gear changes. Mounted individually on the ends of the gear shafts, the clutches engage and release in proper combinations through the operation of a simple selector lever.

LeTourneau-Westinghouse constant-mesh transmission gives you non-stop, instantaneous speed-selection and high reverse speeds. There is no need to depress a clutch foot-pedal . . . no double-clutching . . . no meshing of one gear against another. With quick movement of the small speed selector, operator transfers power instantly from one gear ratio to another . . . with no gear clashing, no chance of locking out-of-gear. It gives faster pickup for drifting a load when dozing, and for pushing or pulling . . . gets more work done in less time!



Air-actuated transmission clutches save seconds — increase production. Each of the five 7" multiple-disc clutches in Tournatractor transmission has 290 square inches of positive gripping surface. These heavy-duty clutches engage and release in proper combinations at the touch of a control-lever. To make clutch adjustments, all you do is loosen a few Allen-head screws and turn adjusting ring "in" or "out". Transmission gears are fully enclosed and operate in a bath of oil. Lubrication points are conveniently located for quick, easy accessibility.

Copyright 1957 by LeTourneau-Westinghouse Co.





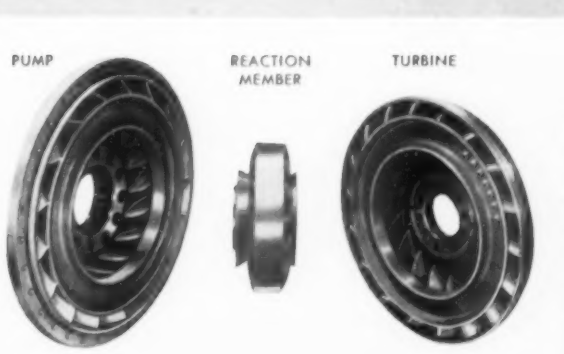
Torque converter saves seconds thru faster, more efficient operation

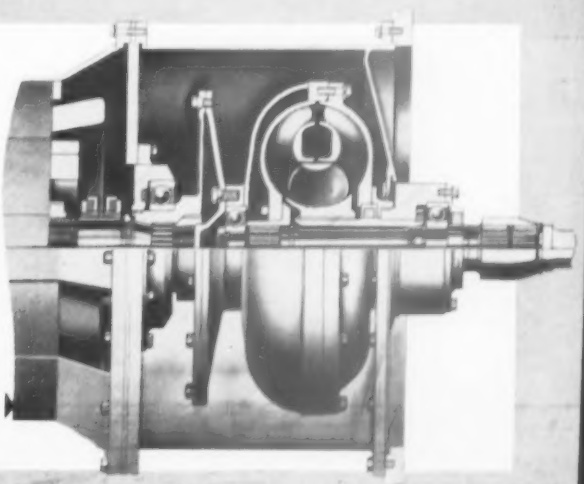
With Tournatractor's highly efficient single stage torque converter you get the equivalent of an infinite number of gear ratios within any gear range. It insures effective application of maximum horsepower at all times, over the complete speed range from 0.0 to 17.2 mph.

The LeTourneau-Westinghouse torque converter is a low-pressure unit, simple, and trouble-free. It has a single impeller, single turbine, and single reactor. Because it operates at low pressure, it is easy to keep the system sealed for lower maintenance.

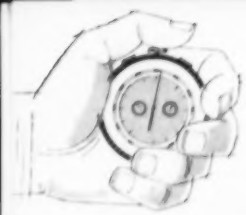
Torque converter smooths out the shock of changing gears. It automatically balances load and torque, making gear selection less critical. Maximum efficiency is secured at *all* times by *all* of your operators. It automatically adjusts the speed ratio for more power, more speed, as needed. It provides you with better performance at all times in all your pit-tractor operations . . . dozing blasted rock on shovel clean-up, maintaining stockpiles, pushing gondolas, pulling other equipment, or maintaining haul-roads.

For more ways to save seconds that add up to bigger profits . . . see next page





Torque Converter is simple, trouble-free . . . has single impeller, turbine, reactor . . . low pressure gives lower maintenance, increased efficiency.

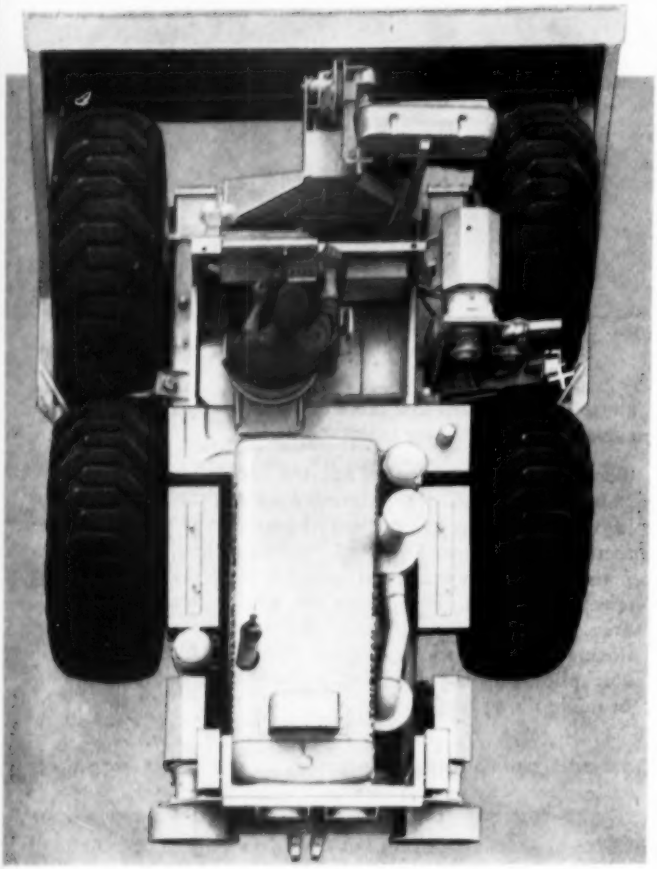


SECONDS SAVED...with

(continued)

FAST ACCURATE CONTROLS

at point-of-action



You save time with easier, faster operation of Tournatractor®

There's no faster control action possible than that provided by Tournatractor's instant-acting electric motor at point-of-action. Push a dashboard switch, and the motor starts instantly . . . reaches 1800 rpm from a standing start in just 1/5 second. At command of the switch, full power is reversed in opposite direction in ¼ second! A simple, spring-loaded, disc-type brake locks the motor automatically when switch is released.

With this motor control system, there is no more "feeling-in" of a clutch, or waiting for hydraulic pressure to build up. There are no more stresses and strains of mechanical stops . . . no slipping . . . no pause to build up power. Operator simply pushes the switch with his finger and gets instant action.

Electric power where you want it with flywheel-coupled generator

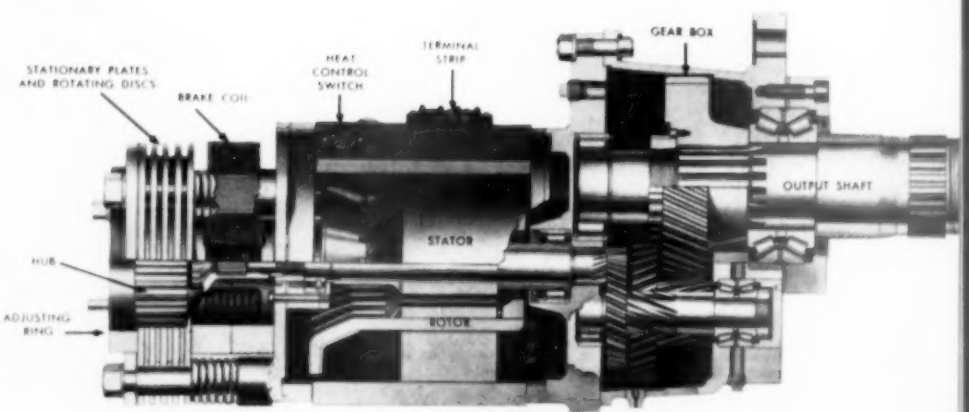
Power for electric controls, lights, and battery charging, is supplied by a heavy-duty AC generator mounted directly in line with engine, as part of the engine flywheel. Engine turns the generator rotor, which produces alternating current to operate point-of-action electric motor which powers blade action of Tournatractor.

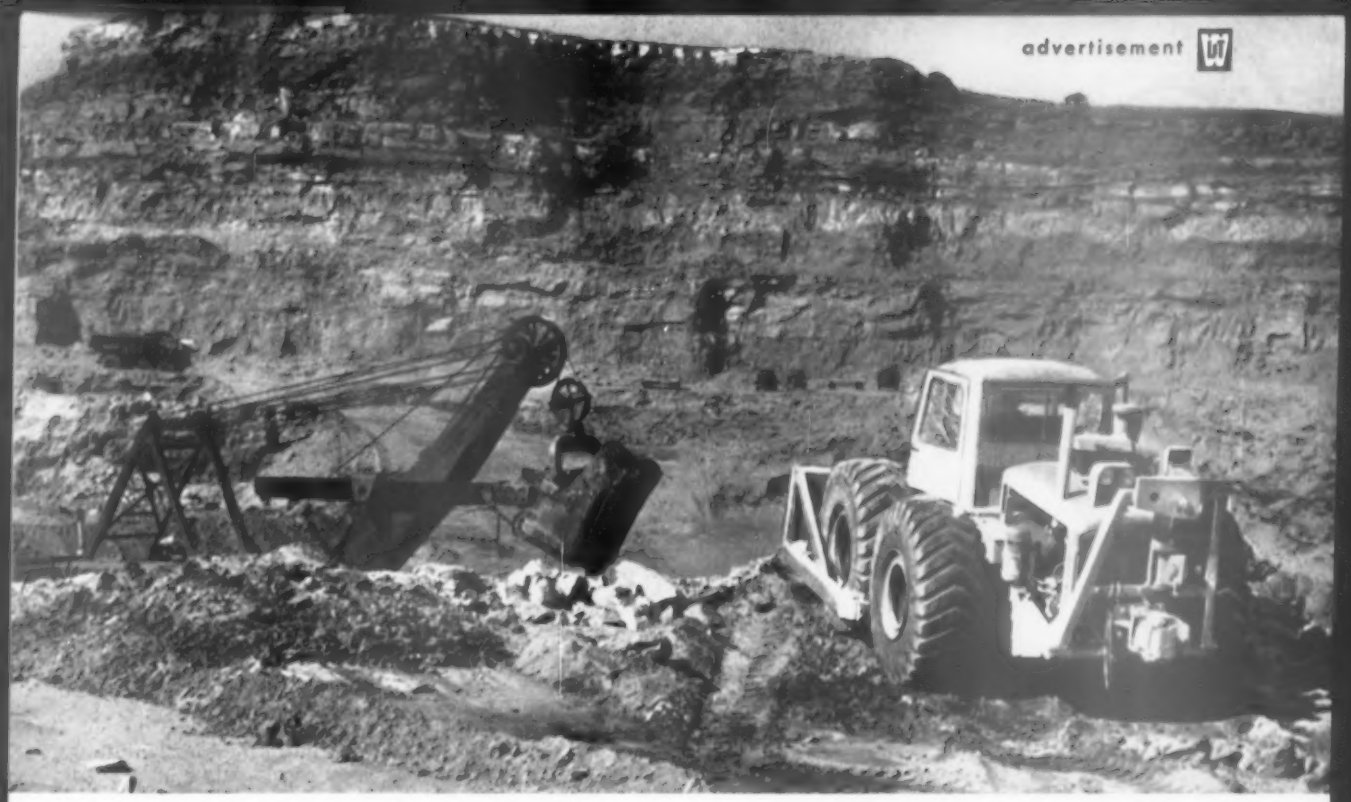
Simple, weatherproof motors

Motor is mounted at point-of-control, where it works most effectively. Cable wear and expense is much lower than that of maintaining hydraulic or mechanical power-control units.

Motors are simple 3 phase, 300 volt AC design, with DC lugging power. They are brushless, compact, consisting of only 2 parts — a rotor and a stator. Rotor fan cools motor, blows out dust and moisture.

Simple, foolproof design makes motors waterproof, weatherproof. There is no change in control-action due to variations of climate or altitude. Motors are so effectively insulated that they continue to operate even when submerged in water.





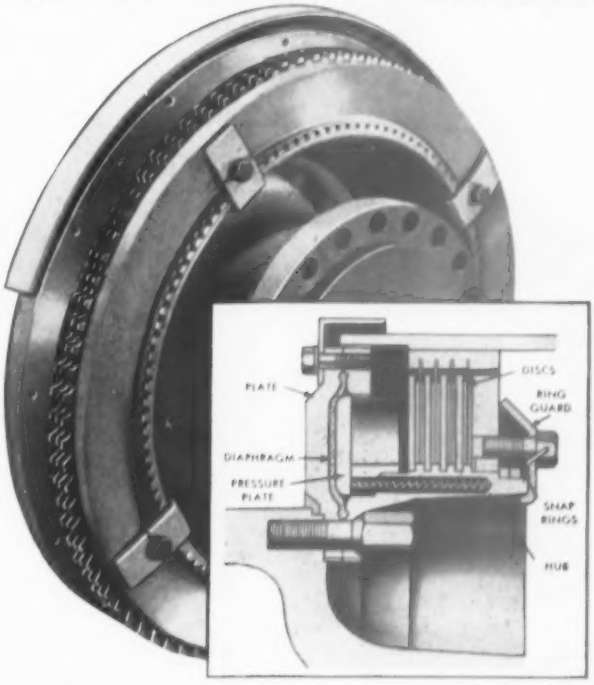
HEAVY-DUTY AIR BRAKES

with 3,762 sq. in. of brake surface

Complete safety on steep banks, narrow pit roads, around installations and equipment

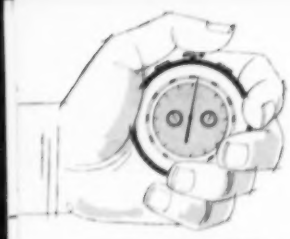
Heavy-duty air brakes on all four wheels provide 940 square inches of braking surface *on each wheel*. These improved air brakes consist of alternately-placed lined and plain steel discs. The lined discs, functioning as a brake-lining, spline to hub of wheel and turn with it. The unlined discs, functioning as a brake-drum, spline to axle and remain stationary. Pressure on brake-pedal operates air-valve which forces the multiple lined and steel discs together to slow or stop the big ground-gripping tires of the Tournatractor.

Master-valve equalizes air-pressure to each of the four wheels. Brakes respond instantly, evenly, to amount of air-pressure released by foot-pedal. Smooth and powerful, these air-brakes provide safe control in any weather, improve maneuverability. Operator has the confidence in his machine to work faster anywhere in your pit . . . on steep banks, twisting haul-roads, on narrow benches, and around shovels and other equipment on the pit floor.



Tournatractor brakes are compact . . . can be removed as an assembly from machine. Their large braking surface means fewer adjustments.

For more time saved with lower maintenance . . . see next page



SECONDS SAVED...

(continued)

WORKS MORE PRODUCTIVE

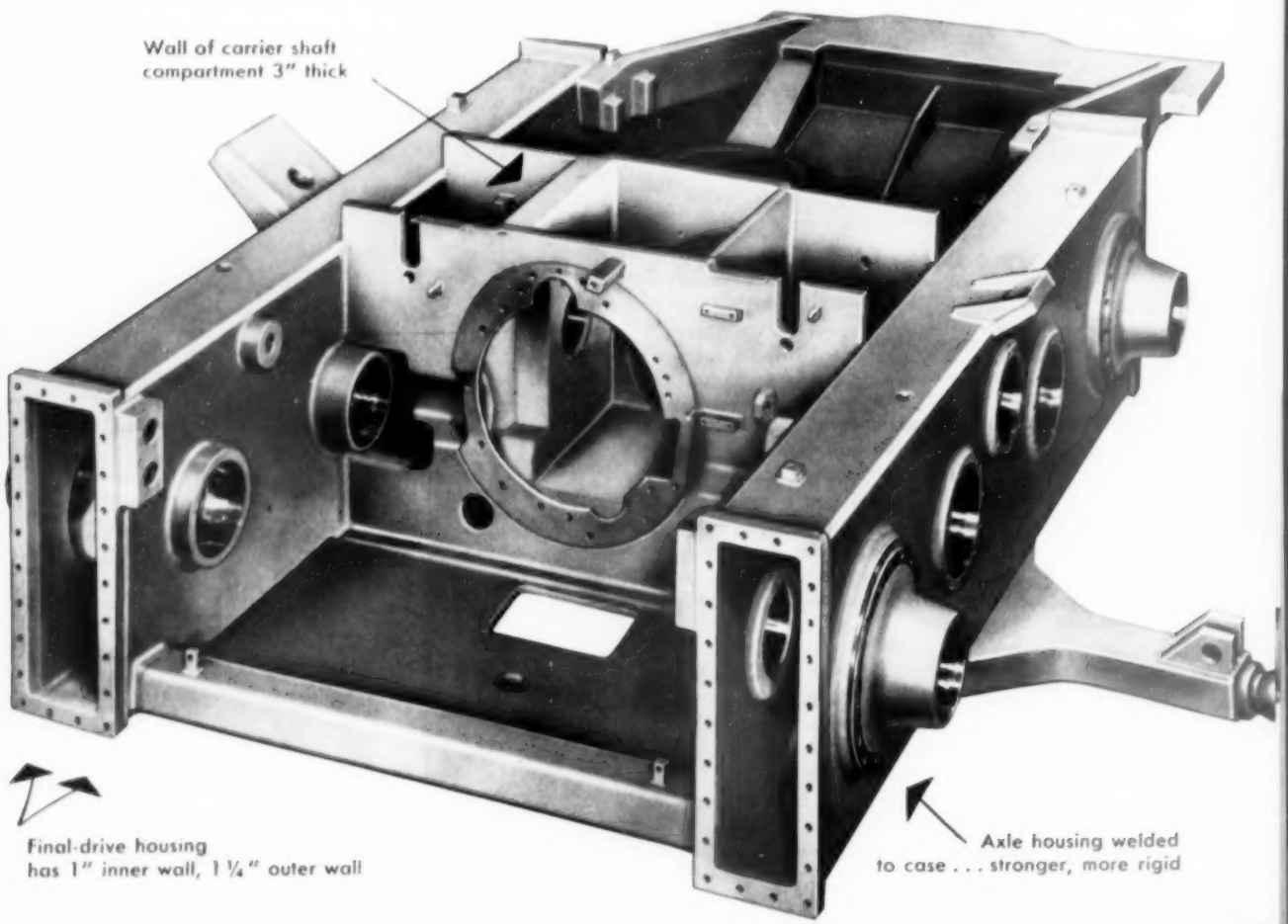
Low maintenance cuts downtime Tournatractor® on scattered pit

On Tournatractor, four rubber-tired wheels do the work of 450 to 550 parts in a crawler-track assembly. Obviously, less maintenance and less lubrication are involved to save time, increase profits.

Over 6 months of steady operation, your Tournatractor charts call for only 660 individual lubrication and regular maintenance operations. For the same period, a crawler may require as high as 1269 operations. That's twice as much service time as needed by Tournatractor. Crawlers require many mechanical service operations and the periodical rebuilding, or replacing, of track assemblies. Since these repairs are often put off, or neglected, because they may seem relatively unimportant, their rapid wear results in loss of efficient power.

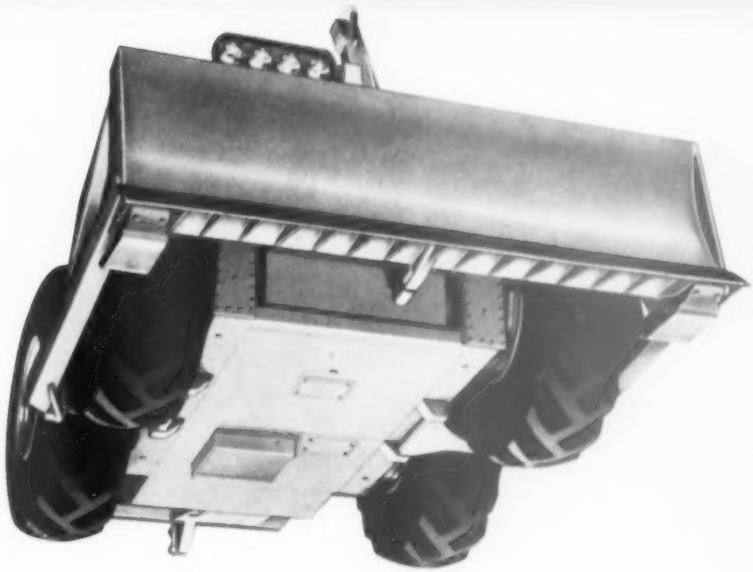
The big, flexing tires on Tournatractor are self-cleaning. Crawler tracks and grousers accumulate mud and grit, increasing wear and power loss. Service takes longer, because extensive cleaning is required for effective lubrication or repair of track assemblies.

Simplicity of electric control at point-of-action on Tournatractor is another feature that keeps mainten-



HOURS

for high-speed assignments



ance costs low . . . equipment efficiency high. Control cables are short to last longer. There is no hydraulic fluid to check and replace, no piping to service, no variation in operation, winter or summer.

Remember, too, that since initial cost of Tournatractor is less than crawlers of comparable engine horsepower, ownership cost is also lower. In addition, because of enclosed anti-friction drive, Tournatractor is better protected from wear, will give you longer life, and higher efficiency of high-speed performance during its lifetime.

Ask for more information

To save seconds that add up fast for greater work-capacity and bigger profits, it will pay you to look further into Tournatractor. Write or phone your LeTourneau-Westinghouse Distributor for free 32-page Tournatractor Bulletin, or ask for a demonstration on your job. See why this high-speed, rubber-tired tractor has faster acceleration, better maneuverability, lower maintenance, to give you the speed and mobility you need in your pit operation.

CT-1450-M



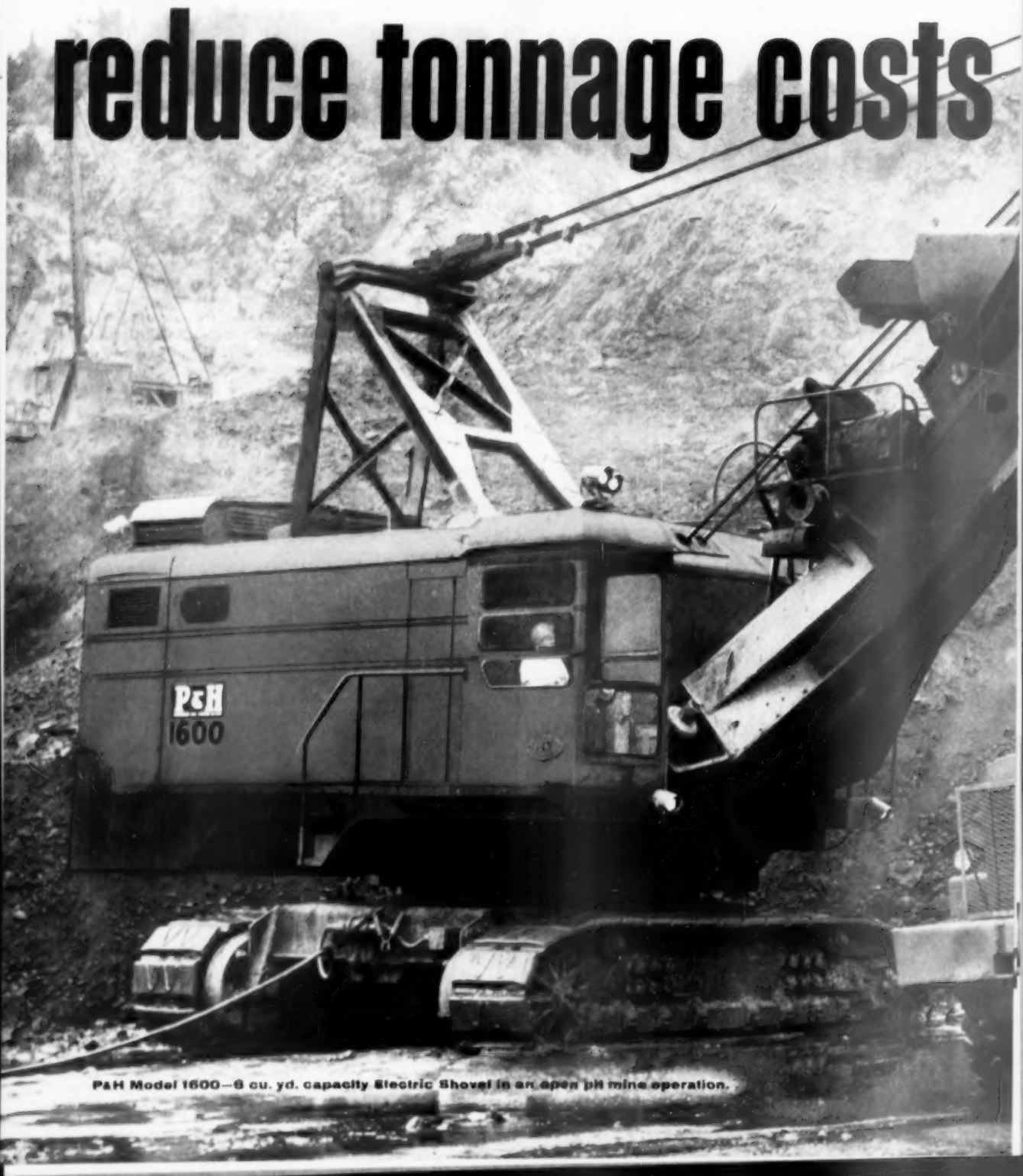


LeTourneau-**WESTINGHOUSE** Company, PEORIA, ILLINOIS

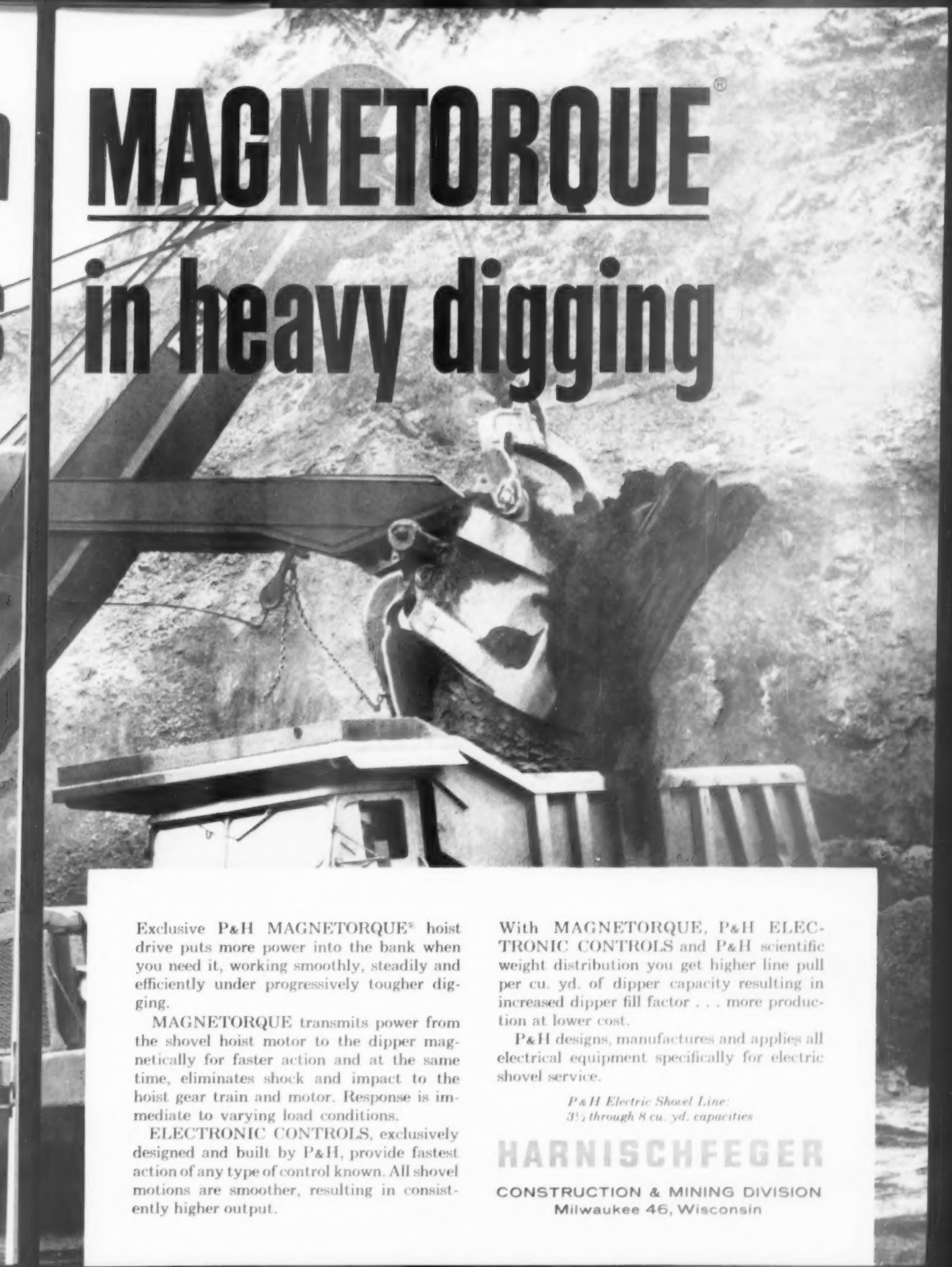
A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

P&H Electrics with reduce tonnage costs



P&H Model 1600—6 cu. yd. capacity Electric Shovel in an open pit mine operation.



MAGNETORQUE®
in heavy digging

Exclusive P&H MAGNETORQUE® hoist drive puts more power into the bank when you need it, working smoothly, steadily and efficiently under progressively tougher digging.

MAGNETORQUE transmits power from the shovel hoist motor to the dipper magnetically for faster action and at the same time, eliminates shock and impact to the hoist gear train and motor. Response is immediate to varying load conditions.

ELECTRONIC CONTROLS, exclusively designed and built by P&H, provide fastest action of any type of control known. All shovel motions are smoother, resulting in consistently higher output.

With MAGNETORQUE, P&H ELECTRONIC CONTROLS and P&H scientific weight distribution you get higher line pull per cu. yd. of dipper capacity resulting in increased dipper fill factor . . . more production at lower cost.

P&H designs, manufactures and applies all electrical equipment specifically for electric shovel service.

P&H Electric Shovel Line:
3¼ through 8 cu. yd. capacities

HARNISCHFEGER

CONSTRUCTION & MINING DIVISION
Milwaukee 46, Wisconsin

HINTS AND HELPS

Profit-making ideas developed by operating men

Send Us YOUR Ideas

We would like to make this column better, and we can, with your help. In the past, we have depended upon our field editors almost exclusively for *Hint and Help* items. However, we feel that a wealth of material exists that only you can uncover. YOUR *Hint and Help* ideas, no matter how simple (in fact, the simpler the better) may interest other readers. For each idea accepted, you may receive either a cigarette lighter engraved with your name or $5.00. A photograph or rough drawing should accompany each item. Send ideas to:

Hint and Help Editor
ROCK PRODUCTS
79 West Monroe St.
Chicago 3, Ill.

Equip belts with vane feeders for uniform loading

FOR A LONG TIME a midwestern operator used a belt conveyor under a set of four shipping bins to load out railroad cars. However, when the belt operated at top capacity, the trajectory of the material often threw it beyond the ends of the car or over the edges, making it difficult to fill the cars uniformly.

The maintenance men rigged up a rotary vane feeder with a power takeoff from the shaft of the belt conveyor. The vane feeder takes material from the belt before it has a chance to spread out, and forcibly throws it down into the car. The vanes have a peripheral speed slightly greater than the material feed, and this produces a carload of material much more compactly and uniformly loaded than before, without spillage.





Fine screening

EFFICIENT SCREENING of fine materials is hard to achieve on most vibrating screens. Often it requires a shallow bed of material and long, wide screen surface.

A midwestern producer of agricultural limestone found that he could improve the efficiency of his fine mesh screen cloth by hanging a set of tire chains on the screen. These chains had the effect of retaining the material on the screen longer and of churning the bed of material so that fines at the top could work down to the screen cloth.

A heavy, large mesh backup cloth supports the fine screen with the additional weight of the chains.

Settling tank problems

EVERY AGGREGATES producer with washing equipment seems to have a problem every time he must start this equipment under load. Electric motors have the ability to start most machinery under load, but operators have come to realize that log washers, sand classifiers, thickeners and settling tanks can plug up "solid" after being shut down only a short time.

One midwestern stone producer found that it took an hour to dig out one washer every time he shut down for any reason. He finally cut two "portholes" near the bottom of this washer, and found that merely opening the porthole would relieve the pressure of stone on the paddles and permit the motor to turn the shaft.

Now this operator cuts small gates or poke holes in each new piece of washing equipment. "Sure it's expensive," he said, "but it saves us an hour's work on each washer every time we shut down." It takes only a few minutes to remove the nuts from the studs holding the gates in place, while the simple rubber gaskets are easily replaced.

(Continued on page 94)



LONG HAUL—Even the longest Barber-Greene Conveyors are built of standardized components . . . produced on a precision, quantity production basis. They can be assembled in almost limitless combinations to cut the time and cost of any material handling job.

Long or short haul—it costs less to move materials with belt conveyors

Thousands of installations—ranging from a few feet to thousands of feet—prove that belt conveyors move bulk material at lowest cost.

No other machine is so simple in construction or requires so little maintenance. No other machine can deliver such high hourly capacities with so little power or attention.

Barber-Greene has given a new meaning to belt conveyor economy. Built of standardized components, Barber-Greene Conveyors are delivered sooner . . . require less engineering . . . are erected faster . . . give top performance . . . and are more easily altered to meet changing or expanding requirements. Being standardized, repair parts are readily available—usually from the stock of your local distributor.



SHORT HAUL—Even the shortest Barber-Greene Conveyors are available in standardized components in the width and length to suit your needs. These small conveyors provide the economical way to handle the widest range of materials with greatest flexibility.

56-7-PE

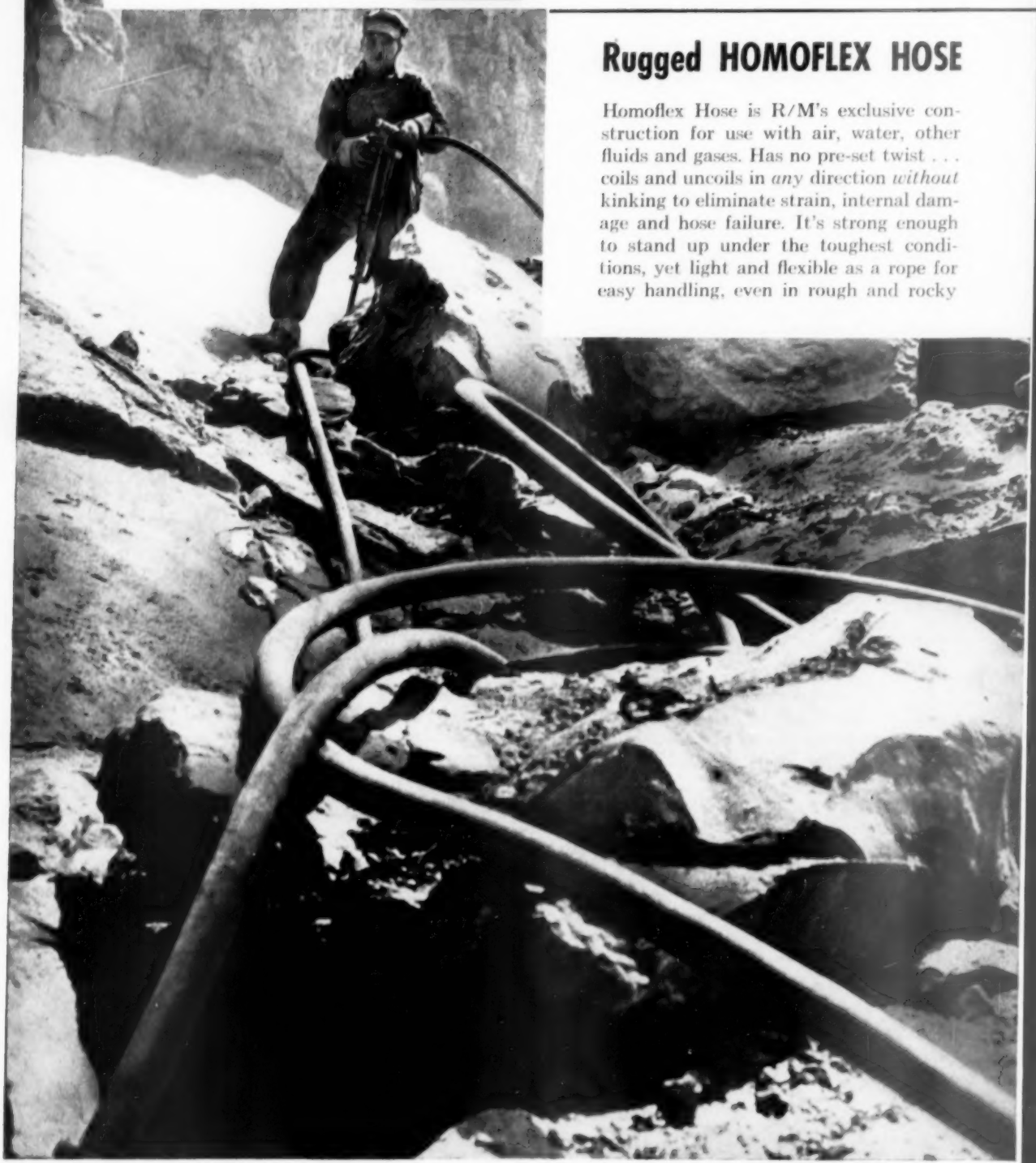
Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

Enter 1509 on Reader Card

Users Say R/M HOSE AND BELTS



Rugged HOMOFLEX HOSE

Homoflex Hose is R/M's exclusive construction for use with air, water, other fluids and gases. Has no pre-set twist . . . coils and uncoils in *any* direction *without* kinking to eliminate strain, internal damage and hose failure. It's strong enough to stand up under the toughest conditions, yet light and flexible as a rope for easy handling, even in rough and rocky

Give You "More Use per Dollar"



. . . is "Flexible as a Rope"!

conditions. Cover, strength member and tube are virtually inseparable. Uniform inside and outside diameters make Homoflex easier to couple, too.

You get "More Use per Dollar" *two* ways . . . Easier handling helps workers to get more work done . . . Hose lasts longer.

Write for Bulletin #6879



Eliminate Belt Matching Problems with R/M POLY-V® DRIVE!

R/M's patented Poly-V Drive employs a *single, endless* V-ribbed belt — eliminating common V-belt matching problems. This new drive delivers up to 50% more horsepower capacity than an ordinary multiple V-drive. Just two cross-sections handle all drive requirements. Lower inventory of belts and sheaves — less maintenance. You get "More Use per Dollar."

Write for Bulletin #6638

For the "Smoothest Running V-Belts Made" Specify CONDOR or R/M SUPER-POWER V-BELTS

*Poly-V is a registered Raybestos Manhattan Trademark.

RAY-MAN CONVEYOR BELTS
Haul Heavier Loads at Lower Cost

This heavy duty conveyor belt has the easy troughability and wear resistance to handle fuller, heavier loads. Cushioned strength members give resilience to the impact of shock loading . . . and flexibility to train naturally. Balanced double compensation construction relieves outer ply stress, prolongs belt life. Ray-Man Conveyor Belt resists gouging and ripping . . . holds fasteners much better than other types of belts . . . requires no breaker fabric. Like all Raybestos-Manhattan heavy duty belts, Ray-Man is moisture resistant and mildew-proof . . . and features the exclusive "XDC" Cover which greatly increases protection against wear, tear, cuts and abrasion . . . You get longer, trouble-free service . . . "More Use per Dollar."

Check also R/M's extra-cushioned Homocord belt for unusually abusive shock loading . . . and R/M Tension-Master for extra long lifts, high tensions.

Write for Bulletin #6915

BELTS • HOSE • ROLL COVERING • TANK LININGS • INDUSTRIAL RUBBER SPECIALTIES

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products: Abrasive and Diamond Wheels • Brake Blocks and Linings • Clutch Facings • Asbestos Textiles • Mechanical Packings • Engineered Plastics • Sintered Metal Products • Industrial Adhesives • Laundry Pads and Covers • Bowling Balls

Enter 1673 on Reader Card

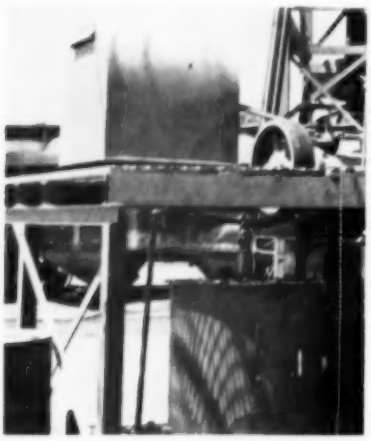
HINTS AND HELPS

(Continued from page 90)

Converted railroad car

THE PRIVATE RAILROAD CAR of a southern limestone producer has been converted to a deluxe mess hall for the officers and supervisors. The car is parked on a landscaped siding and equipped with water, electricity and a good cook.

Plain and fancy

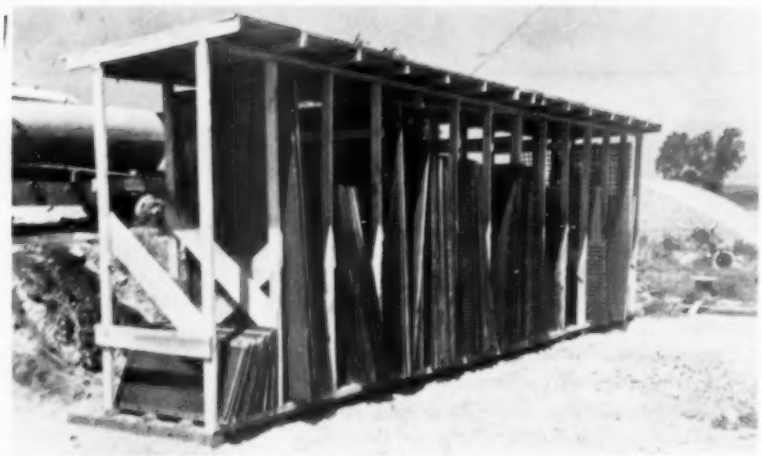


THIS IS ABOUT the fanciest sheet metal motor housing we've seen. A midwestern sand and gravel producer thought enough of his motor to protect it from snow, rain or blowing sand with this housing. Even though it is a new, well protected and properly insulated motor, this operator feels that the extra protection is worthwhile insurance against premature maintenance work.

Clay handling

MANY PRODUCERS in the rock products industries have enough clay in their rock, sand or gravel deposit to cause difficulty during the winter or in rainy seasons. Several midwestern producers of road aggregates, where a small amount of clay is desirable, found that one or two sheets of steel chained in the bottom of their rear-dump trucks reduced the amount of material sticking to the bottom.

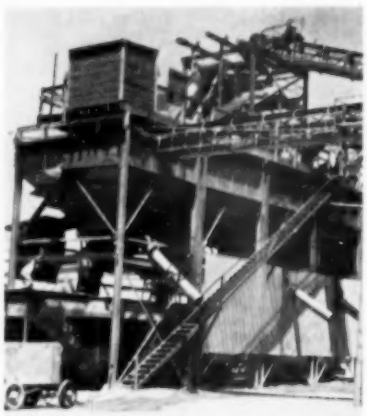
The plates lie flat in the bottom while the truck is being loaded. As the trucks are dumped, the plates swing free on short lengths of heavy coil chain and throw the clay-coated material out with the rest of the load. While this method does not completely solve the problem, truck bodies are now cleaned by hand once or twice a day, instead of every other load.



Screen cloth care

ANY PRODUCER with a vibrating screen knows how difficult it is to take care of spare screen cloth to keep it in shape for immediate use in the screen frame. Left to their own devices, the cloths often turn up with bent selvedges and warped mesh. The smaller mesh cloths are limp, fragile and easily damaged.

Here a midwestern stone producer solved his screen cloth problem with a sturdy, simple storage shed. This keeps each cloth in an accessible position without danger of damage. Inventory of usable screens can be determined at a glance, and the various sizes kept in separate compartments. No longer must he spend profitless time in searching for a spare cloth or in beating it into shape before it can be installed.



Bin water drainage

ONE OF THE MINOR headaches of producers of washed aggregates is the accumulation of water in shipping bins. When water seeps through bottom gates it messes up the truck drive or rail tracks, corrodes the gates and often flushes out when the gates are opened.

This midwestern aggregates producer cut holes near the bottom of his bins, covered each with screen cloth just smaller than the material to be handled, and fitted each hole with a long spout. This arrangement is much more effective than bottom drainage, and takes the water off to the side, out of the way of traffic.

Belt hold downs

A MAJOR HAZARD for a long horizontal or inclined belt conveyor is the chance that a high wind will rip the belt off the idlers. While steel bars can be welded to the conveyor frame, they only keep the belt from being ripped off and blown away.

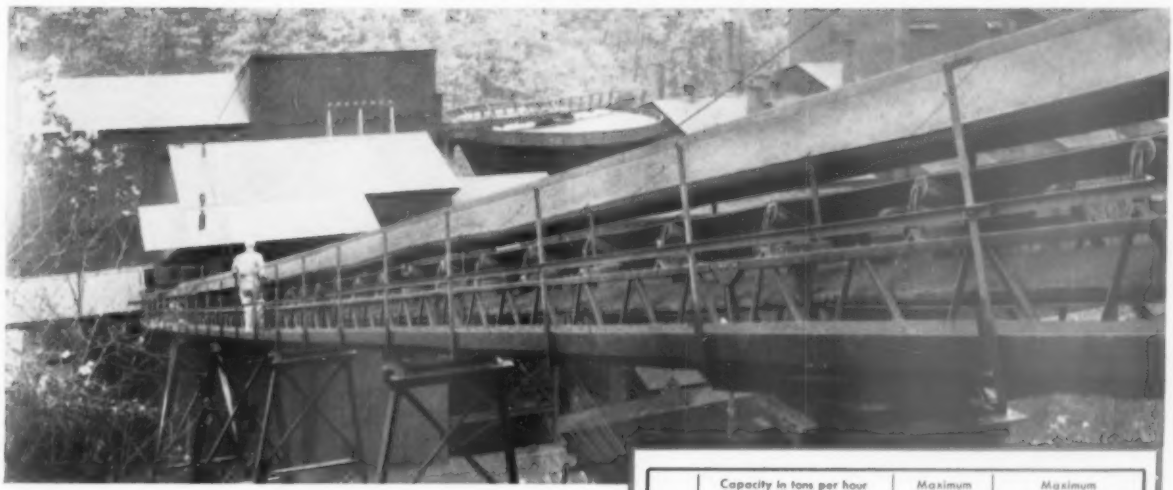
A midwestern sand plant operator discovered quite by chance that a full load of material on the belt was quite effective to prevent a wind storm from lifting a belt off the idlers.

Limestone plow



THE OOLITIC LIMESTONE in this Florida producer's quarry is so soft and friable that he is able to plow it up. A cutter bar mounted on the front of a bulldozer cuts a swath about 8 in. deep and 36 in. wide to pile the broken stone in windrows. A high-lift then can easily load out the material into trucks.

END

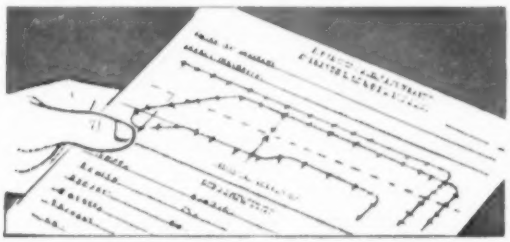


For lower costs down the line
make your belt conveyors

PRE-BILT by LINK-BELT

Belt width, inches	Capacity in tons per hour at belt speed of 100 FPM			Maximum lump size, inches		Maximum recommended belt speed, FPM	
	Weight of material, lbs. per cu. ft.			Sized	Unsized	Half maximum size lumps	Maximum size lumps
	50	75	100				
18	27	40.5	54	3	5	400	300
24	50	75.0	100	4½	8	500	400
30	81	121.5	162	7	10	600	450
36	117	176.0	235	8	14	650	500

EASY SELECTION. Your Link-Belt engineer will help you choose the best combination from a wide selection of PRE-BILT sectional belt conveyor components.



PROMPT ESTIMATES. From standardized data, an "on-the-site" quotation can be prepared covering the components for your needs.



SPEEDY DELIVERY. Standardized parts are shipped from the nearest of 8 plants. One-source availability eliminates the delay of co-ordinating purchases from several suppliers.



FAST INSTALLATION. Due to simple construction and shop-assembled components, you can do your own erecting. Link-Belt also furnishes complete erection service and supervision.

Link-Belt PRE-BILT sectional belt conveyors combine operating efficiency and economy to give you years of dependable, profitable operation.

For full information on these durable conveyors up to 36 in. wide—with drives up to 40 hp, 24 and 42-inch truss depths—contact your nearby Link-Belt office, or send for Book 2579.



LINK-BELT

BELT CONVEYORS

14,702

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville (Sydney), N.S.W.; South Africa, Springs. Representatives Throughout the World.

Enter 1598 on Reader Card



A single drop of used oil from this truck indicates true condition of the vehicle's oil . . . and tells a lot about the engine's operation.



Daily oil checks assure maximum lubrication efficiency in this diesel locomotive.

Now—they're testing used oil in minutes

THE NEED for a fast, accurate and practical method for determining the condition of used oil has long been one of the more serious problems confronting fleet operators. It's obviously wasteful to discard still-good oil, but operating a vehicle with contaminated oil could lead to costly engine damage. This was an unsolvable condition which maintenance men had come to accept.

Since no two vehicles, even of the same make and model, are identical in performance or operation, maintenance men were compelled to compromise on oil change "averages" recommended by engine manufacturers. This procedure is uncertain and costly. Fortunately, this operating conflict has been resolved with the introduction of a simple but completely reliable oil check system . . . the Shell ADC Oilprint Analysis.

The ADC Analysis was primarily conceived to determine proper oil change intervals for individual engines. However, it goes much further. It is capable of actually reducing engine maintenance costs by disclosing certain mechanical defects *before* they have caused serious engine damage.

The test procedure is very simple . . . requires little practice to perfect . . . and provides a reliable check of oil from merely two drops of used oil. In minutes, the degree of *A*lkalinity, *D*ispersancy and *C*ontamination can be determined easily.

Here are several typical examples from various areas of the country. They show how fleet operators, employing both diesel and gasoline engines, have successfully and profitably applied the ADC program.

A Kansas City Freight Line

Operating a large fleet of trucks, one Kansas City freight line previously had drained and replaced oil every 3,000 miles. After adopting the ADC Oilprint Analysis, individual test charts showed that, in most cases, drainage would not be necessary at less than 6,000-mile intervals. Even at this doubled interval, engine life was not affected. Further proof was established when these engines were inspected at 87,000 miles and no appreciable wear was found on bearings, pistons, rings or valves.

An Idaho Logging Operation

Oil had previously been drained after a limited number of hours of use on an Idaho company's diesel locomo-



Substantial oil economy is realized in this tractor, because oil is changed only when indicated by the Oilprint.



Taking a quick "fingerprint" of crankcase oil from an interstate carrier.

tives. With the ADC Oilprint Analysis as a guide, the oil-change interval has now been safely increased many-fold. The savings made possible by this on-the-spot test in oil, filter change and labor costs were considerable. Furthermore, leaky head gaskets are frequently discovered before any serious engine trouble develops. Here is another valuable plus for the ADC Oilprint Analysis.

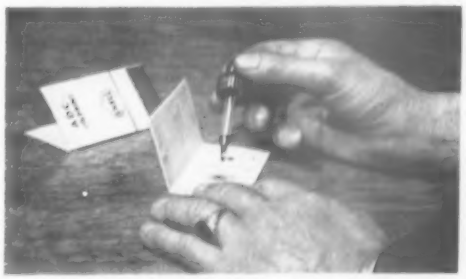
A Washington, D.C., Transit Company

This transit company operates a large fleet of buses with both gasoline and diesel engines in use. With the difference in operating schedules . . . rush hours, short and long hauls, around-the-clock schedules . . . both engine types were believed to require complete oil changes every 2,000 miles. When the ADC program was instituted, the tests showed that oil-drain periods and minor maintenance checks could be safely extended to every 3,000 miles for gasoline engines and 4,000 miles for diesel engines.

Fleet operators, who are concerned with extending the service of crankcase oil and avoiding the risk of using contaminated oil, are invited to sit in while a Shell service engineer demonstrates the time-and-money advantages of an ADC Oilprint Analysis program.



Photo shows an oil-spot test card . . . one phase in the visual life record of a change of oil.



One drop of a special indicator* fluid developed by Shell checks the alkaline reserve in the oil.

*Indicator Fluid U. S. Patent No. 2,770,530

SHELL OIL COMPANY

50 WEST 50TH STREET, NEW YORK 20, NEW YORK
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

SHELL

Enter 1580 on Reader Card

By JOSEPH N. BELL

Are you getting your money's worth from your trade association?

The answer is yes—if you're taking advantage of all the services they have to offer

WHILE TALKING RECENTLY with a top executive in one of the rock products industries, I ran afoul of a question that neither of us could answer.

"Why not," I suggested, "check with your trade association? Don't they have an office just a few blocks from yours?"

He looked at me querulously.

"Yes, I guess they do," he answered, "but we never have much to do with them. I don't even know the names of the people who work over there."

This man's company contributes a considerable amount of money to several trade associations. In light of this attitude, there is some room for doubt that the company is getting value received from any of them. Yet, it isn't the associations' fault at all. They offer the services, but they can't force the members to take advantage of them. And those members who don't consider the services worthwhile have a solid voice to go in and try to modify or improve them.

There are a surprising number of trade association members in the rock products industries who either take little advantage of the associations to which they belong or take practically no active part in setting the course or administering the affairs of the associations. Yet, for the most part, these are good businessmen, in a growing and prospering industry. Their lack of knowledge on industry trade associations is not typical of the sharpness with which they otherwise operate their businesses. They simply have a blind spot on trade associations; they've fallen into the easy trap of belonging because it's fashionable to belong — without bothering to find out what the trade association can offer and then taking maximum advantage of the money they've invested in membership.

If you think none of this applies to you, sit down right now and try to make a list of the services your association offers. You'll find that your list probably doesn't even scratch the surface. And this applies equally to local and national associations. Both perform important functions, and neither makes any pretense (or shouldn't) of omnipotence at all levels.

Familiarity with local situations or problems is an advantage that local associations can almost always offer over a national group. Yet, probably the best way to handle such problems is to work through the local association with tools provided by the national group. The local association also can build a fire under half-hearted members of the industry. And, by bringing individuals of like interests together locally, it can stimulate the broader thinking so necessary to the support of a national organization equipped with all the guns needed to represent the industry nationally. The suggestions that follow apply both to local and national associations in the rock products field. There are hundreds of good local organizations, much too numerous to try and name. And there are also a number of really outstanding national trade associations in our industry. They include: the National Sand and Gravel Association, Portland Cement Association, National Crushed Stone Association, National Lime Association, National Industrial Sand Association, National Agricultural Limestone Institute, National Slag Association, and others. Serving the related concrete products field are the National Ready Mixed Concrete Association, National Concrete Masonry Association, American Concrete Institute, Prestressed Concrete Institute and a few more good ones.

But these are generalities. Of much more importance to you, personally, are the answers to two questions: "How can I assess the value of a trade association to my business?" and "Am I getting the most out of my trade association membership?" You get out of a trade association in exact proportion to what you put into it. To determine how much you are putting into yours— and how well it repays you in value received — consider the following questions:

Do you know what services are offered by your association?

The first requisite toward realizing the maximum benefit from trade association membership is knowing what they can do for you—not in general terms, but specifically. With this knowledge firmly in mind, you're much more likely to turn to them when they can be of real help. There are many ways to enlarge your knowledge of association services: you can visit association headquarters the next time you have the opportunity; talk or write to a few key people and ask some pointed questions; or collect such information at the next association convention. This sounds so basic as to be almost ridiculous. Yet, remarkably few association members have a thorough understanding of the services their association can legitimately per-



Trade associations

continued . . .

form for them—even though they have been pouring money into the organization for many years.

Do you use the merchandising aids provided by the association?

One of the inherent advantages of any group coalition is the enlarged purchasing power of the group as opposed to that of individuals. And one of the areas of trade association work in which this tells the most is in the preparation of merchandising aids. Creative work—as expressed in sales literature, advertising mats, publicity kits and many other promotion devices—is tremendously expensive. So is printing and the other mechanical processes necessary to produce such material. The association is able to buy top-notch professional talent and is also able to cut the unit cost by ordering in large quantities. The association member who doesn't take full advantage of this is missing a considerable benefit. If the member feels that the material being produced by the association is not suitable or not worthy of the money being invested in it, he should say so and not just withdraw from use of this material.

The building materials field is rugged and highly competitive these days. The competition is putting out attractive and hard-hitting sales promotion material. If you aren't using the output of your own trade association to the utmost in stimulating local sales, you're passing up one of the largest advantages of association membership.

Do you tie-in effectively with national advertising and publicity?

Publicity and advertising in national media—magazines, radio, television, motion pictures—pack a tremendous wallop with the people in your community. You should take maximum advantage of this impact by tying yourself in with it locally as often and as fully as possible. How? There are many effective ways. Let's suppose your trade association is able to stimulate a story in a national magazine outlining the problems faced by the sand-and-gravel industry in zoning disputes. Undoubtedly you'll be able to buy reprints of the article for a few cents a copy. Mailings might be made to public officials in your own community with a short covering letter from you; the local press could be contacted and supplied with reprints that might turn up as a local feature story or editorial; blow-ups of the article could be displayed in and around your plant; your employes should be supplied with copies to enhance their understanding of your problems; and you might deliver or mail reprints to your neighbors.

The same techniques apply to other types of national promotion. National advertising or publicity on new applications of your product should



be used locally to the hilt—both as a means of education and local sales stimulations. In this way you can make the national activities of your trade association **really** pay off locally.

Are you familiar with the scope of assistance offered by your association on technical problems and do you take full advantage of this help?

Just as trade associations are able to employ highly skilled professional people to prepare sales promotion material, so too can they hire technical experts to tackle problems that come up in the processing and use of your products. These experts are able to gather and correlate information from all over the country, digest it and draw conclusions from it. When you have a specific problem, the chances are rather good that someone else has had it before you and the technical experts in your trade association can give you a quick answer. And if they don't know the answer, they usually have facilities to go in search of it.

There is a wide divergence of services offered in this direction by the various trade associations in the rock products field. Sometimes, if a problem is peculiar only to one locality, it's impossible to divert a technician's time to this narrow field long enough to get a satisfactory answer. But this is the exception rather than the rule. And even if they can't offer an answer, the association staff can offer help—in one form or another—on almost every technical problem. You should know specifically how far their services go in this direction, then take full advantage of them. And the chances are good you'll be helping someone else by reporting your problems, because you'll be adding to the aggregate of knowledge at association headquarters on pertinent technical matters.

Do you use association material and help in dealing with local public officials?

One of the great advantages of an association is its collection of data from other people in your industry. Most of the problems you have had and will be having with public officials have happened to others, as well. Knowledge of how they handled it is useful to you in your predicament; it can sometimes serve as a guide to you in handling your own problems. The association can also offer you authoritative backing in dealing with public officials—by supplying all sorts of statistical and research information to bulwark your arguments. And, in extreme cases, they can even help you personally, by sending someone out to the scene of action. This can't occur too frequently for two potent reasons: (1) it usually isn't good in your local relations to bring in an outsider to take part in a purely local dispute and (2) obviously the association, with its limited manpower, can't send a personal representative to take part in all such discussions. But it can supply ammunition—lots of it—and this source of help shouldn't be ignored.

Do you provide material requested by your association to help them in making their work more effective?

Trade association membership is a two-way street. If the association's work is going to be effective, they must have the tools with which to work—and often times you must provide a great many of those tools. This doesn't begin and end with your membership dues; you also must be willing to contribute information, photographs and other materials that the association can use in its work. It would seem that members think their responsibility ceases when they pay their membership dues. The result is usually that a few enlightened members who come through with material—especially in the sales promotion area—reap the greatest benefit from national promotion because their materials are consistently used. Every association member should be constantly alert for local data that will help the cause nationally; they quickly will find that sending this material in to the national association will help them locally, too.

Are you active, really active, in the affairs of your association?

One of the most common failings of association members is to stand off at a distance and complain bitterly about the work of the trade association to which they pay dues—without attempting to do anything constructive about upgrading its work. At the same time one of the great shortcomings of trade associations is that they are overly sensitive to the individual voices of their members. Consequently, those who raise the loud-

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By RICHARD S. HUHTA

5 seconds . . . 4 . . . 3 . . .

Morrison-Knudsen Co. detonates

THE WAITING WAS ALMOST OVER and the only sound penetrating that overcast Sunday morning last July was the count: 5 seconds . . . 4 . . . 3 . . . 2 . . . 1 . . . and then, suddenly, with a thunderous roar, the largest nonatomic explosion in the United States was detonated. In a second, the months of planning were fulfilled, the jittery nerves and tense faces relaxed, as 1.7 million lb. of explosive burst loose, shattering approximately 3 million tons of rock.

This was a coyote shot—the fourth in a series at the Morrison-Knudsen quarry on Promontory Point, an almost isolated peninsula jutting into the northern half of Great Salt Lake. Its purpose: to provide rock fill for the Southern Pacific's causeway across the lake (See Rock Products, Jan. 1957, p. 108).

The explosion was rather undramatic considering the amount of dynamite used—there were no giant gushers of smoke or showers of flying rock. Instead, the side of the cliff heaved slightly, leaned forward and slowly crumbled into a massive array of broken, sharply split quartzite. But this was to the credit of the engineering staffs of Morrison-Knudsen Co. and their technical advisors from Atlas Powder Co. who had labored long, hard and apprehensively throughout the operation.

One spectacular display was provided, however,



2 . . . 1 . . . WHOOMP

largest nonatomic explosion at Promontory Point

when, as might be expected in a blast this size, power lines snapped, illuminating the mounting dust cloud with sparkling flashes of electricity.

The preparation for the blast was a major mining project in itself, requiring the close coordination of several engineers, scores of workmen plus thousands of dollars worth of time, labor and materials.

The site of the big blast was Quarry No. 2 on Promontory Point. Here, two 5 x 7-ft. entry tunnels, 1,300 ft. apart, were driven 600 ft. in depth into the face of the 200 ft. high quarry. From these entry tunnels, two incomplete crosscuts spaced on 100-ft. centers were driven between the tunnels and parallel to the quarry face. The north and south sections of crosscut No. 3 (there have been two previous coyote shots at this location, thus this is the third crosscut at the quarry) came to within 60 ft. of each other and there the drilling halted. The north and south sections of crosscut No. 4 were driven through the hard quartzite rock to within 40 ft. of one another. Again the drilling stopped at this point. The exhaust from compressed air drilling provided adequate ventilation with a standby ventilation fan if needed.

According to Bert Shirey, quarry superintendent, it took his crews about 100 working days to



Muck is hauled from north portal . . .



. . . and explosives ladened mine cars enter . . .

Largest nonatomic blast

continued . . .

drive the crosscuts with regular mining equipment and standard tunnel driving techniques. And it was here, in these crosscuts, that the explosives for the big shot were placed.

The loading operation called for a series of 40 pockets (20 in each crosscut) to be filled with Amocol, a bag-packed, nitrocarbonitrate blasting agent and 50 lb. sticks of 60-percent dynamite. The charge in each pocket, consisting of approximately 80 percent Amocol and 20 percent dynamite, was individually calculated and varied from pocket to pocket depending upon the characteristics of the rock. Consequently, the pockets themselves, originally designed to be spaced on 50-ft. centers, also varied.

Dynamite, laced with a detonating fuse to set off each individual charge, was used as a primer and was packed tightly into the middle of the bags of Amocol in each pocket. Some dynamite was also scattered throughout the charge to insure complete detonation. Roughly 50,000 to 75,000 lb. of explosives were brought into the tunnels on mine cars, unloaded onto a conveyor belt in each crosscut section and crammed tightly into the pockets by hand. Altogether, a total of 1,432,000 lb. of Amocol and 358,000 lb. of dynamite were packed into the base of the cliff. However, both crosscuts were not equally charged. Crosscut No. 4 took a heavier load (about 50 to 60 percent more powder) than did crosscut No. 3.

Hooking up the shot with Primacord required an extreme degree of caution to assure that all connections were in good operating order. To further assure against misfiring, two separate detonating fuse trunk lines were used in each crosscut and a "jumper" was hooked up at every third pocket. The trunk lines ran from the most remote pocket to the entry tunnel where a millisecond delay electric blasting cap was taped to each trunk line. Instantaneous caps were used to detonate all four trunks in crosscut No. 3 while 25 millisecond delay caps set off the trunks in crosscut No. 4. All eight caps were connected in series to a heavy gauge lead wire. Although No. 14 gauge is normally used for 220 v., No. 8 wire was selected to reduce voltage drop over 1,000 ft. of wire necessitated by the terrific amount of explosives to be detonated.

Once a pocket was completely filled with explosives, the primer charged, the trunk lines run out and all wire carefully checked, the tunnel was backfilled with sand for several feet to the next pocket location. Here the entire procedure was repeated: packing the explosives, wiring up the charge, checking the connections and then backfilling with sand.

The backfilling chore required a specially designed, track-mounted machine. Sand was hauled into the tunnel in a screw conveyor equipped hop-





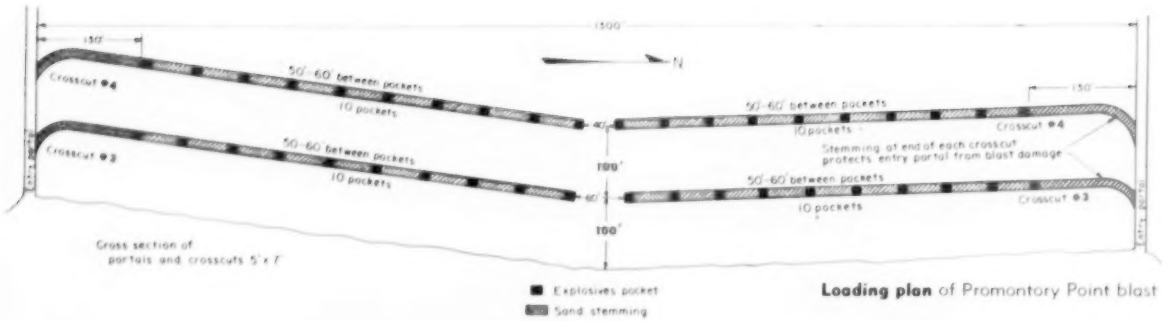
. . . sacks of blasting powder are carried to pocket by conveyor, unloaded and packed by hand . . .



. . . detonating fuse is laced into primer . . .

. . . and conveyor backfills tunnel with sand





Loading plan of Promontory Point blast

The broken pile of rock produced by the explosion



Largest nonatomic blast

continued . . .

per which fed the sand to a 15-ft. inclined conveyor belt. This conveyor carried the sand to a smaller and much faster belt mounted on rubber-tire wheels. This second conveyor moved from side to side, throwing the sand to the roof of the tunnel and packing it tightly between the pockets of powder.

The loading and stemming procedure continued for 21 days until the 10th pocket in each crosscut section was completed. Then the last 130 ft. in each of the four sections was backfilled with sand. In doing this the M-K men hoped to blast the four holes, yet save the entry tunnels for future use. (Morrison-Knudsen Co. has scheduled one more blast at the quarry; thus additional cuts in preparation for the blast can be driven from these tunnels while the present rock is being used as fill.) Their well-engineered advance planning paid off for, after the blast, the entry tunnels were undamaged.

With all preparations set, the area was completely blocked off and at least a dozen newsmen and photographers were on hand to watch the blast. Both crosscuts were fired simultaneously from a point about 1,000 ft. away while newsreel cameras ground away.

Almost imediately afterward, bulldozers began clearing a working area while electricians probed for loose power lines and newsmen scrambled over the broken, shattered rock.

Most of the stone obtained from this blast will be trucked to huge barges, taken out into the lake and then dumped into the 12,000,000 cu. yd. core of the causeway. Some of the larger boulders will be used as riprap. When this is done, a fleet of flattop barges with dozers on board will be used to haul more material to raise the causeway to water level. Finally, quarry run rock will be carried by rail and rear-dump trucks to build the fill to a 17-ft. elevation above the water. Southern Pacific estimates that this project will be completed by April 1960, at a total cost of approximately $49 million.

The entire project is under the supervision of James N. Wells, Morrison-Knudsen vice president in charge of the company's Los Angeles office. Guy Reid is the project manager, William A. Stewart is assistant to the project manager and Bert Shirey is quarry superintendent. The Morrison-Knudsen men were assisted by E. F. Daily, manager of the San Francisco office of Atlas Powder Co. and Ralph Conner and Joe Sanders, Atlas Powder Company's technical representatives in Salt Lake City.

EQUIPMENT USED AT THE MORRISON-KNUDSEN QUARRY

Blasting agent, Amocol	**Atlas Powder Co.**
Primer, Giant Extra 60-percent dynamite	**Atlas Powder Co.**
Drilling machines, # '99s, (2)	**Gardner-Denver Co.**
Shovels, # 150B 6½ cu. yd., electric (3)	**Bucyrus-Erie Co.**
Trucks, bottom-dump, 25 cu. yd. (11)	**Euclid Div. General Motors Corp.**
Trucks, end-dump, 17 cu. yd. (15)	**Euclid Div. General Motors Corp.**
Conveyors	**Hewitt-Robins, Inc.**

END

Here's how to set up an effective job evaluation program

Job analysis may save you money

By ROBLEY D. STEVENS*

THE PROBLEM OF PROMOTING the will to work, meeting wage demands and determining what constitutes a fair and equitable rate for a certain job perplexes many employers. In any field—but especially in the nonmetallic minerals field—sound management-employe relations are considered essential to economical and efficient operations. It is possible to get a better day's work from supervisors and foremen and employes alike when mutually satisfactory relationships exist. Often it makes the difference between a profit and loss operation. To gauge the performance of your company and your employes, there is no substitute for setting up a sound and practical job evaluation program, based on a thorough analysis of every job.

The term "job" is used in different ways and has different meanings. To some it means a specific task, to others it means a group of tasks—a position; to still others it means a group of similar positions—a job.

A task is created whenever human effort must be exerted for a specific purpose. When enough tasks are accumulated to justify the employment of a worker in your company, a position has been created.

A job also may be defined as a group of positions which are identified with respect to their major or significant tasks. A job may be considered as a group of positions which are sufficiently alike to justify their being covered by a single analysis.

The initial step in any job evaluation program is defining and analyzing, recording and studying all the factors and conditions involved in a job. Job analysis tells who does what; it is a process of delineating the requirements of a job by observation and study, and reporting pertinent information relating to the nature of each job. It is an objective determination of the tasks which comprise the job and of the skills, knowledge and abilities as well as the responsibilities required by the employe for successful performance, the factors which differentiate his job from all others.

There are three parts to the analysis of any job. The job must be completely and accurately identified; the tasks of the job must be completely and accurately described; and the requirements the job makes upon the worker for successful performance must be indicated.

Job analysis can also be used to determine job requirements showing the qualities required of the worker to fill his job, for recruiting and placement purposes.

It is usually desirable for a job analysis to cover the following information: job title, number employed, date of job analysis, alternate title, work performed, experience, training data, performance requirements, job knowledge, mental application, physical application. The following four job evaluations systems are those most commonly in use:

The ranking system. This is often referred to as the cardsorting system, because the jobs are arranged from high to low, as in the cards of a playing-card deck. All the jobs are then ranked in order of importance—in terms of other jobs, not in terms of money and without reference to the worker or workers holding down the job. The best method is to list the jobs in each department on a separate sheet, horizontally, and have the foreman arrange

Please turn to page 182

Management Consultant

African cement firm took a look—then went to vertical kilns

Find that vertical shaft kilns can use fuel unacceptable to others and allow expansion to meet increasing market

By C. A. WHITE*

THE LARGEST VERTICAL SHAFT kiln works in the British Commonwealth is that of the British Standard Portland Cement Co., at Mombasa, Kenya, now in its second stage of expansion. The factory was erected and two kilns were in production by 1954 and a third in 1955. The success of the initial production of 150,000 tons per year from a design rating of 100,000 tons, justified plans to double the factory in the next two years with the installations of three new kilns. The first of these is scheduled for production this year.

Discussions regarding the need for a cement works in Kenya had been going on for 20 years until 1951, when geologists of the Amalgamated Limestone Corporation of Great Britain carried out a survey. By then the need for more cement was urgent—cement consumption in Kenya was five times the 1946 consumption. In 1951, the "A.L.C." combined with "Cementia Holding A.G." of Switzerland to form British Standard Portland Cement Co., Ltd., of Kenya.

"Cementia" has been responsible for much of the development of the modern vertical kiln, including the rotary grate and the introduction of discharge sluices. In the past, the vertical shaft kiln has been considered suitable only for marls and not for separate raw materials: this theory has been disproved.

Kenya has no internal fuel supplies, water is generally too scarce for wet processes, and the only economically favorable fuel was anthracite duff from South Africa. For these reasons, the new company decided to build a vertical kiln installation seven miles north of Mombasa port with shaft kilns using coral stone and clay for the first time. That the project was fully justified may be judged from the figures in Table 1 and by the production for the year from April 1, 1956 to March 31, 1957 of 146,000 tons of cement.

Consumption of cement in Kenya and British East Africa has been as follows:

	Kenya	B.E.A.
1938	17,000 tons	53,000 tons
1945	21,000 tons	62,000 tons
1950	124,000 tons	275,000 tons
1955	200,000 tons	480,000 tons

Production capacity of the three plants which will be operating next year will then meet the demand and will provide for increased consumption. Until 1953, all cement was imported at the high price of about $39 per ton. If the present consumption of nearly half a million tons had to be met by imports, it would mean a trade debit of more than $17 million. The rapid development of the local cement industry has improved the trade balance by this amount during the last five years.

The published information of various cement companies indicates that during recent years the capital expenditure has averaged $42 per ton of annual capacity for new plants. It is interesting to note that the capital invested at the Mombasa works for the present capacity is approximately half this figure, even with the use of the most modern designs and high-quality building and

*Chemist, British Standard Portland Cement Co., Ltd.



Side view of kiln house showing blowers on the first floor, kiln shafts on second, burner's platform on third and nodulizers on fourth floor

machinery. This is only in part due to the use of shaft kilns by an estimated cost of $2 per ton of capacity.

Modern vertical shaft kilns have gained a strong foothold in cement production and the figures in Table 2 outline their relative advantages. These figures vary with design and operating conditions.

The fact that the vertical kiln can use fuels unacceptable to others is of greatest importance. Vertical kilns run very successfully on anthracite screenings, a product frequently left in heaps at the mine, and they are equally effective on poor quality coke breeze. These two fuels are the best suited for vertical kilns, though other types of coal may be used. No milling of fuel is necessary and porous shaft clinker requires less than 90 percent of the power required for grinding rotary-kiln clinker, giving a favorable power consumption.

Further advantages are the small unit structure, allowing expansion to meet the increasing market of developing areas. In highly developed areas the small ground space requirement of the kilns is important, and initial capital expenditure, maintenance and running costs are frequently less than other processes.

Our new plant, under the supervision of Dr. Felix Mandl, managing director, is located some ¾ of a mile inland at the limit of an up-raised coral reef which covers a large area to the north

TABLE 1

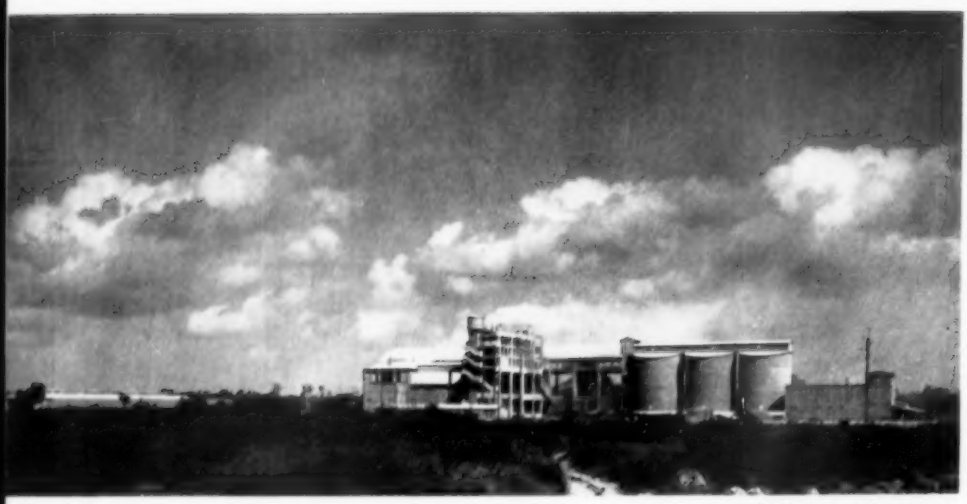
Physical test averages of daily spot samples from packing plant for same period according to British Standard 12 (Temperature 29 deg. C.)

Residue on B.S. 170 sieve	Specific Surface Blaine	Initial Set Hr. Min.	Final Set Hr. Min.	LeChatelier without aeration mms.	Compressive Strength p.s.i. 3 day.	7 day.
6.5	3370	1 33	2 45	4.2	5,280	6,110

TABLE 2

Heat and power consumption of cement kilns

Type of kiln	Heat in. cal./g. for kiln	Power in Kwh./t. for plant
Vertical shaft kiln	950-1,000	90
Lepol process	850-1,000	100
Humboldt process	900-1,000	100
Dry rotary kiln with preheater	1,200	105
Dry rotary kiln without preheater	1,550	
Wet rotary with preheater	1,300	95
Wet rotary without preheater	1,700	



East view of the factory



Burner's platform. Kilnhead is shown in the foreground. Kilns are beyond

Vertical cement kilns

continued . . .

of Mombasa. This reef now stands at a maximum of 60 ft. above the sweet water table. Though such reefs are usually very variable in composition, this is not the case at Mombasa. There is no overburden, but at the minus 30 ft. level a silica sand occurs as an old beach deposit, allowing control of the silica module.

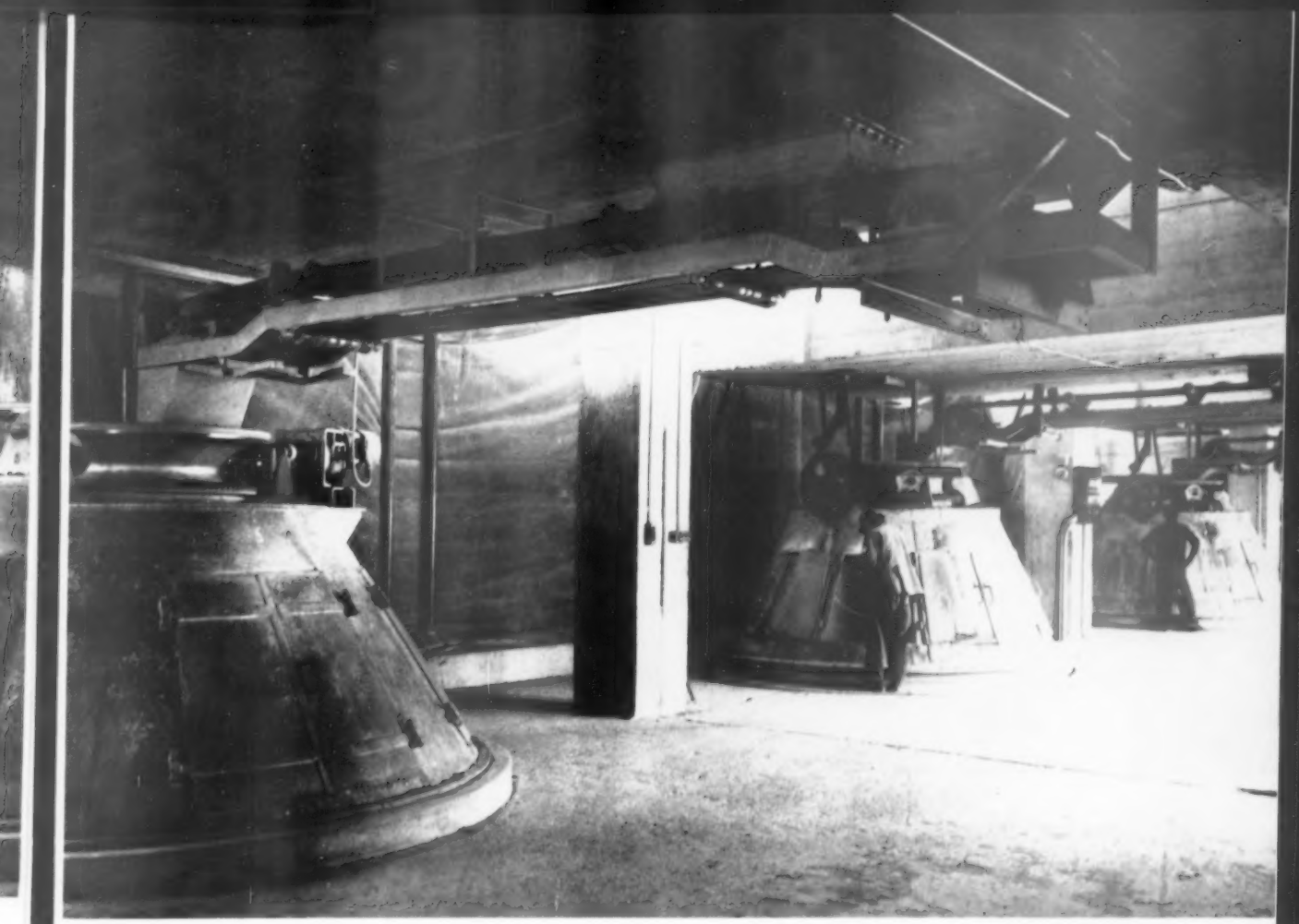
An excellent deposit of soft shale occurs about three miles inland with a particularly constant composition. The average analysis of the coral and shale is given in Table 3.

After blasting, electrically powered 1½-cu. yd. excavators load the coral into 12-cu. yd. lorries. The excavators are assisted by two Caterpillar Traxcavator No. 6 shovels, which can be switched to the shale quarry. A half-mile haul brings the coral to a Krupp hammer crusher with an output of 60 tph. crushing to a nominal 1-in. size. The present raw material crushing plant will be used as standby for the new Hazemag impact breaker. This will crush 150 tph. and will reduce wetter material than was possible with the hammer crusher.

The initial mixing of the clay and coral is done by lorry batching in the crusher hopper. This produces a material too rich in clay, but this is corrected in the mill with the addition of pure crushed coral. It is now possible to crush a material mix with up to 12 percent moisture, but at an admittedly reduced output. Tests on the new crusher have shown it will now be possible to crush shale alone and feed it separately to the mill. The crushed materials are taken by belt and bucket elevators to the two main bunkers containing pure coral and coral clay mixtures; an additional two bunkers hold furnace coal and a mineralizing additive.

The Krupp air-swept drying mill is 5.5 meters long and 2.8 meters in diam. It is guaranteed for 25 tph. but averages 30 tph. in the dry season. Capacity drops to 20 tph. as moisture at the mill inlet rises to 10 percent. Feed is by rotary tables for the coral admixture with a belt doser for the mineral additive. Despite laboratory checks every 20 min., a high variation of plus or minus three percent moisture occurs at times in the meal.

It has been found possible to blend this material in silos very successfully. There are now eight 300-ton silos and three 50-ton blending silos. Two blending silos are fitted with Moller homogenizing equipment and one with Polysius equipment, and are used to batch 50 ton lots of meal ahead of the 150-ton kiln feed bunker. The mill building will be duplicated with the coal fired furnace as standby to oil firing for both old and new mills. Duplication of raw meal silos with installation of inlet and outlet star feeders will permit efficient blending



of the meal from 12 silos, while the remaining four will provide ready mixed kiln feed.

Very frequent laboratory control maintains the plus or minus .3 of 1 percent or less $CaCO_3$ variation desirable for kiln feed. Experimental runs have determined the optimum modules for high production with the kilns, but other factors such as fuel particle size, fuel type and burning properties, and mineralizing additives, also affect production. A silica module of 2.1 to 2.5 percent gives the most easily controlled high production, while raising this to 2.6 to 2.8 percent can cause trouble with burning conditions and lower production. However, this effect may be due to a physical change in the silica component from clay to sand. Ignition temperature, burning rate and surface area or particle size of the fuel have a great influence. Anthracite ¼-in. mine screenings of 11 percent volatile are fed by the main gantry crane from storage into an adjacent bunker to the kiln feed. The meal and anthracite are now weighed and mixed by electrically sequenced batch weighers maintaining a full circulating system feeding all three kilns.

TABLE 3

Chemical analysis of raw materials

	Coral (percent)	Shale (percent)
$CaCO_3$	90.	—
SiO_2	6.5	60.
Fe_2O_3	.8	7.5
Al_2O_3	1.6	18.5
CaO	50.	3.
MgO	.5	3.
Loss	39.	7.5

This system will be altered to permit greater flexibility when the new kilns are put into production. The anthracite will be screened and oversize will be crushed in an impact breaker. This will allow fuel particle size control. Bunkers for kiln feed and for anthracite will supply each pair of kilns, with continuous individual scales for each kiln. These new scales will give a more efficient mix of the fuel and meal, and will eliminate segregation of the fuel and meal which now occurs when circulating the mixture to the three kilns.

Please turn to page 187

From this . . .



Here's one way to lick

THE MAYOR OF THE VILLAGE of Northport, Long Island, lives on an old gravel pit—and likes it. So do the members of the yacht club, the Sea Scouts, the Police Athletic League and other residents; for the area is now one of the most coveted on the North Shore, due to the singular efforts of the Steers Sand and Gravel Corporation, operating in Northport since 1923.

This enterprising firm has solved the problems peculiar to an industry in a residential area by turning its worked-out waterfront land into an asset to the community and to itself. Steers is converting the section to A-1 residential property, hiring its own experts to plan and plant the development and donating a considerable part of it to the community for various public groups to use. It has turned hostile neighbors into enthusiastic supporters by these efforts and through a practical promotion program that has employed advertising and open houses to bring the people around.

Even before the firm dug its first hole it ran into opposition from irate townspeople who feared that their village would become blighted. Soon after Steers purchased 165 acres there, citizens held a protest meeting in a local theater to consider these vital questions: "Shall we permit a sand-and-gravel works to be established in our midst? Shall we permit the most beautiful harbor of Long Island to be disfigured forever? Shall we permit our village to be ruined as a place of residence? Shall the village be zoned?

But the referendum on zoning was defeated. The plant started operations in March of 1923, and grew rapidly to become one of the biggest in the New York area. Among projects for which it has supplied aggregate are Idlewild Airport, the United Nations Building and the New Jersey Turnpike. Northport, however, was not impressed, and each additional piece of property Steers elected to mine brought a flurry of protests.

. . . to this



One enterprising gravel firm overcame community resistance by effective public relations and by rehabilitating their land

zoning restrictions

By EILEEN M. LARSEN

After World War II, the company began rehabilitating about 30 acres of its used-up land and selling it for residences and to the yacht club. For guidance in this movement, the firm turned in 1950 to Olmsted Brothers of Brookline, Mass., who planned development layout on the entire area, including roads, lots and landscaping. In the plans were sections reserved for the Police Athletic League rifle and archery range, the Northport Fire Department Fair Grounds and a children's league ballfield.

The next year Steers purchased 85 acres as future reserve and met with a sizeable rhubarb by residents both as to the purchase of the property and to extending operations to adjoining property on a royalty basis, for which the firm had contracted in 1933. Those opposing Steers acquired 900 signatures on a petition demanding that operations be stopped. The company took its case to the public, countered with a doorbell-ringing campaign, advertised in the papers and circularized the village with letters. The result: a petition containing 1,685 signatures urging the operation be allowed to continue.

Then the firm presented the Olmsted rehabilitation plan to the Village Board with a request that they sit down and discuss operations according to the plan. When the trustees refused, local merchants petitioned them to permit continuance. After a lengthy battle with the state Supreme Court and the Zoning Board of Appeals, a public referendum was held to determine whether Steers should continue operations under the proposed plan or be restricted to the original property.

The firm won the referendum by a decisive margin—1,340 to 554. In January 1953 Northport enacted a new "A-6 Residential Rehabilitation" zone, and Steers was given 12 years to operate according to the Olmsted plan. At the end of the period



Zoning restrictions licked

continued . . .

the property, to be called Northport Bay Estates, will revert to A-1 residential area. The plant agreed to fence the property, to remove no topsoil, and to post a $500,000 performance bond.

The inspiration for holding an open house for Northporters came after the plant applied last year for a small variance in the zoning ordinance to allow digging within 20 instead of 200 ft. of a perimeter road on a 1½-acre tract. One of the opponents to the change gave a clue to townspeople's lack of sympathy when he remarked that they couldn't view the operations from the inside. Immediately the company decided to open the property to them.

Again Steers went to the newspapers, to publicize its party. An invitation, formally worded, urged everyone to come and see the plant and the property, and to join members of the firm afterwards in the plant office for refreshments. Transportation was afforded, and for those who wished to drive their own cars through, arrows were set out directing them along the new roads. Visitors were invited to see the private beach, note the imposing homesites and the donated rifle range and inspect plant operations, kept up during the open house for their enlightenment.

The party was such a success that popular demand brought forth a bigger and better open house this summer. Officials from the village and surrounding towns, county and town highway representatives, executives from other rock-products firms in New England and local and New York reporters came to see the show. One group of Connecticut gravel industrialists arrived by boat to inspect the project. As part of the celebration the rifle and archery ranges were open to the children and the Sea Scouts' new boat was on display at the company's pier.

This time, after the tour, the public was given a chance to share refreshments with Walton Scherer, local landscaping specialist, and veteran Master Forester J. J. Levison, an expert on trees, both employed by Steers to help restore the property. They appeared at the party to answer questions about the rehabilitation program and about the visitors' own garden dilemmas.

Watching work crews following in the path of the diggers to install drainage systems and build roads, company president, J. Rich Steers summed up his firm's efforts this way: "I believe the production of sand and gravel and development or improvement of property can go along hand in hand and be a benefit to the community. Our program proves that an excellent residential community can be the end result of proper sand and gravel operations, more than paying its way taxwise and fitting closely into the growth of the Village."

END



Another view of the rehabilitated land

An Invitation To An Unusual Afternoon

The
Steers Sand and Gravel Corporation

Invites You

To its Second Annual

"OPEN HOUSE"

Saturday, July 13

1:30 P. M. to 4:00 P. M.

Refreshments

In case of rain the date will be postponed to July 20.

We want you to see one of the most unique projects of its type in the nation.

* The new beaches

* The first waterfront house

* Our nursery where many species of trees are being developed

* The Sea Scout Base Net-ting

* The PAL Rifle Range

* A modern sand and gravel plant

* Expert advice free of charge on your garden-ing and tree problems

Last year a large number of people came to see for themselves the progress that has been made in our twelve year rehabilitation program, one of the most comprehensive of its kind in the world. Conversion of an excavated area into a prime residential area of our North Shore is proceeding ahead of schedule. We would like you to see what can be done.

Walton Scherer of Northport, landscaping specialist, and Master Forester J. J. Levison of Sea Cliff, foremost expert on trees, will explain their parts in making the area beautiful and help you with your special problems.

Please enter through Bluff Point Road and stop at the parking area. Our drivers will take you from there to every part of the property, and explain what we are trying to accomplish.

J. Rich Steers

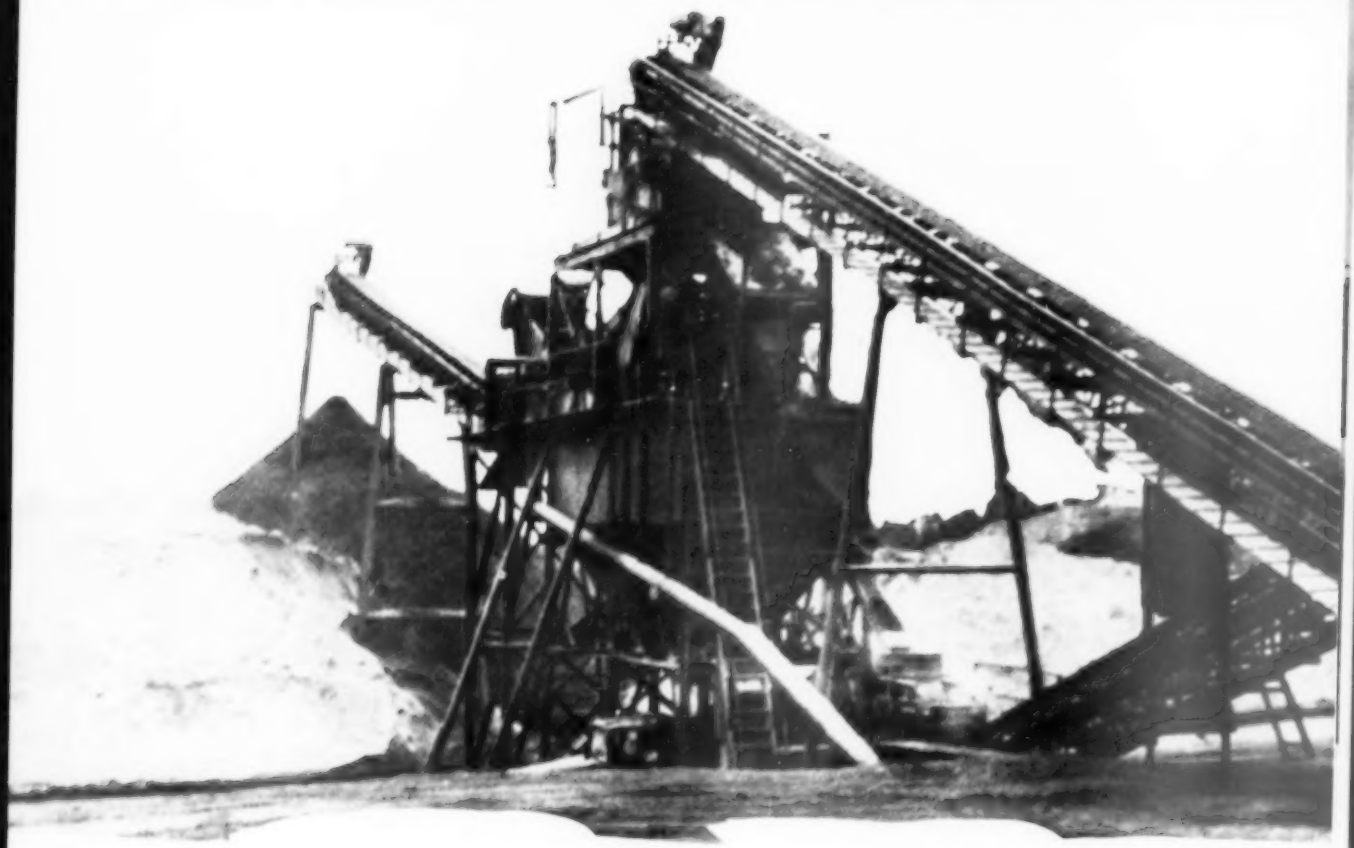
Steers Sand and Gravel Corporation

Northport, N. Y.

An example of effective promotion. Steers ran this invitation in the local paper, received a tremendous turnout

Roads and trees where once there was only a cliff and sand show transformation of Steers Sand and Gravel excavation. The new road eventually will continue to Askaroken after bank, top center, is lowered





Booming market rolls toward

CAPISTRANO ROCK AND SAND CO. is in a location where its market will grow toward it. On the southern edge of Orange County in California, it is one of the outlying sand and gravel producers in the Los Angeles area. The sand-and-gravel deposit in the alluvial bed of Arroyo Trabuco near San Juan Capistrano is a strategic location for an aggregates producer serving the southern edge of metropolitan Los Angeles.

Here the area is growing southward on two fronts: The Long Beach harbor area is booming down the coast line while the Santa Ana freeway is pushing through the canyons along US 101 to meet the Pacific Ocean at San Juan Capistrano. The harbor expansion means new oil wells, refineries, manufacturing plants and marine installations—all voracious consumers of concrete.

The freeway construction takes plenty of the top-quality aggregates that Capistrano Rock produces. The residential areas and service industries which follow the freeways provide a solid and growing market for sand and gravel.

The gravel-producing plant is operated by R. E. Davis, general foreman, under the supervision of C. W. Dashner, general superintendent, but needs only six men to run at full capacity. To meet normal needs the plant operates about 16 hrs. a day at the rate of 200 tph., but in times of peak demand it has operated around the clock. "It's an easy plant to run," says Mr. Davis. "Most of our work is maintenance, and in 15 months of operation we have lost only two bearings."

The gravel deposit has the material to meet the specifications of the profitable but exacting market for concrete aggregates. About 55 percent of the pit-run material is sand; the rest is hard, well-rounded gravel which meets all California specifications for concrete aggregates. There are few large cobbles to be crushed, while the distribution of pit-run sizes meets market requirements.



Secondary crusher reduces oversize to be recycled to washing and screening plant

Overall view of the plant. Washed sand storage, left background; recycle from crusher is screened at right to remove asphalt chips



ideally located producer

Screens and washers are mounted above shipping bins





Dragline is shown working three benches of gravel pit. Wash water from the plant is settled in the two ponds above the water table and recirculated

Booming market

continued . . .

The gravel deposit is being gouged out of an orange grove now growing on the thin overburden of top soil. A ¾-cu. yd. dragline has worked three benches down to the water table about 60 ft. below grade and keeps the three 10-ton diesel trucks busy hauling material to the primary jaw crusher. The crusher is kept operating at top capacity by changing the speed of the reciprocating plate feeder under the concrete hopper. The sizes vary in different levels of the pit, and a variable speed drive enables the operator to keep the feed close to the capacity of the crusher. A bar grizzly scalps off the plus 2 in. for the crusher and allows the minus 2 in. material to fall through to the 24 in. wide inclined belt below.

The belt conveyor carries the raw feed to the top of the washing and screening plant where a 4 x 12-ft. three-deck vibrating screen makes the size separations. High-pressure water sprays at the screen wash the sand off the gravel and flush the sand to a flume leading to a double-screw sand classifier. Washed and dewatered sand is discharged to a stationary, inclined stacker belt to be taken to storage.

The vibrating screen can make a wide range of sizes, while gates in the chutes can take cuts of these sizes to make blends. Ordinarily, the top deck takes off the plus 1⅜-in. gravel to be chuted to the two-roll secondary crusher at ground level. Extra flexibility is provided by a 3 x 6-ft. vibrating screen to take out the minus 2-in. material and send it back to the shipping bin.

Crushed oversize is dropped to a conveyor and taken back to the main inclined belt to be mixed with the raw feed material. However, it can be diverted to a small vibrating screen to remove the minus ⅜-in. crushed stone for the neighboring asphalt-mix plant. This screen not only gives a profitable by-product, but it reduces the amount of crushed fines in the finished aggregates coming from the washers.

The second deck of the main vibrating screen has a ¾-in. mesh cloth. The plus gravel can be directed to a shipping bin to be mixed with the larger rock, or more frequently, washed in a twin-screw gravel washer before shipment. This is the most popular product of the plant with about 100 tph. output.

Pea gravel from the third deck of the screen is washed and dewatered in a wheel-type rotary screen before it is discharged into a shipping bin below. Normally about 15 tph. of this size is made.

The four-compartment shipping bin loads trucks for direct shipment or for stocking out for pile draining. Trucks dump within reach of field shipping bins. The demand for more sizes and blends of pile-drained gravel has grown steadily, and

Please turn to page 198

EQUIPMENT USED AT CAPISTRANO

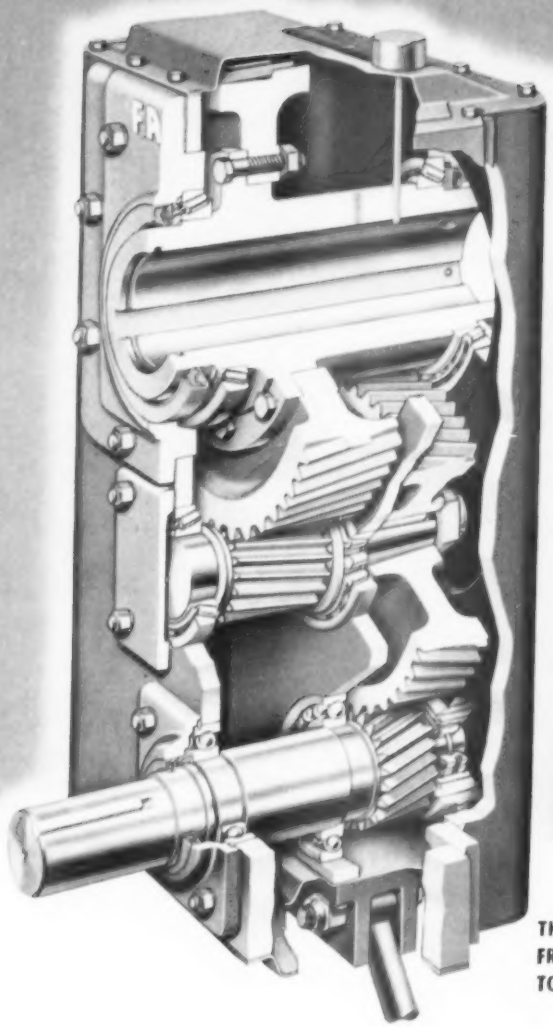
Vibrating screens, Conveyors, Primary jaw crusher, Secondary roll crusher	Pioneer Engineering Div. of Poor & Co.
Layout and erection	Pioneer Engineering in conjunction with Cook Bros. Construction Machinery Co.
Sand washer, Gravel washer	Eagle Iron Works
Dragline	Bucyrus-Erie Co.
Clamshell storage crane	Northwest Engineering Co.
Field hoppers	Likens and C. S. Johnson Co.
Trucks	International Harvester Co., The Four Wheel Drive Auto Co.
Pump	Fairbanks-Morse and Co.
Lubricants	Shell Oil Co.

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- **for lower output speeds**



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Check These Features

New — 3-wall, one-piece housing provides double the ability of cast iron to withstand external impact or shock loads.

New — ratio range—5:1, 14:1 or 25:1. Higher ratio range makes possible lower output speeds...smaller sheaves...standard, rather than slow-speed, motor.

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This is the second in a series of articles on the Portland Cement Association's research and development laboratories

By HUBERT C. PERSONS



Test to failure of concrete column showed, among other things, that reinforcing bars may safely be placed in bundles at column corners, held by a single tie bar



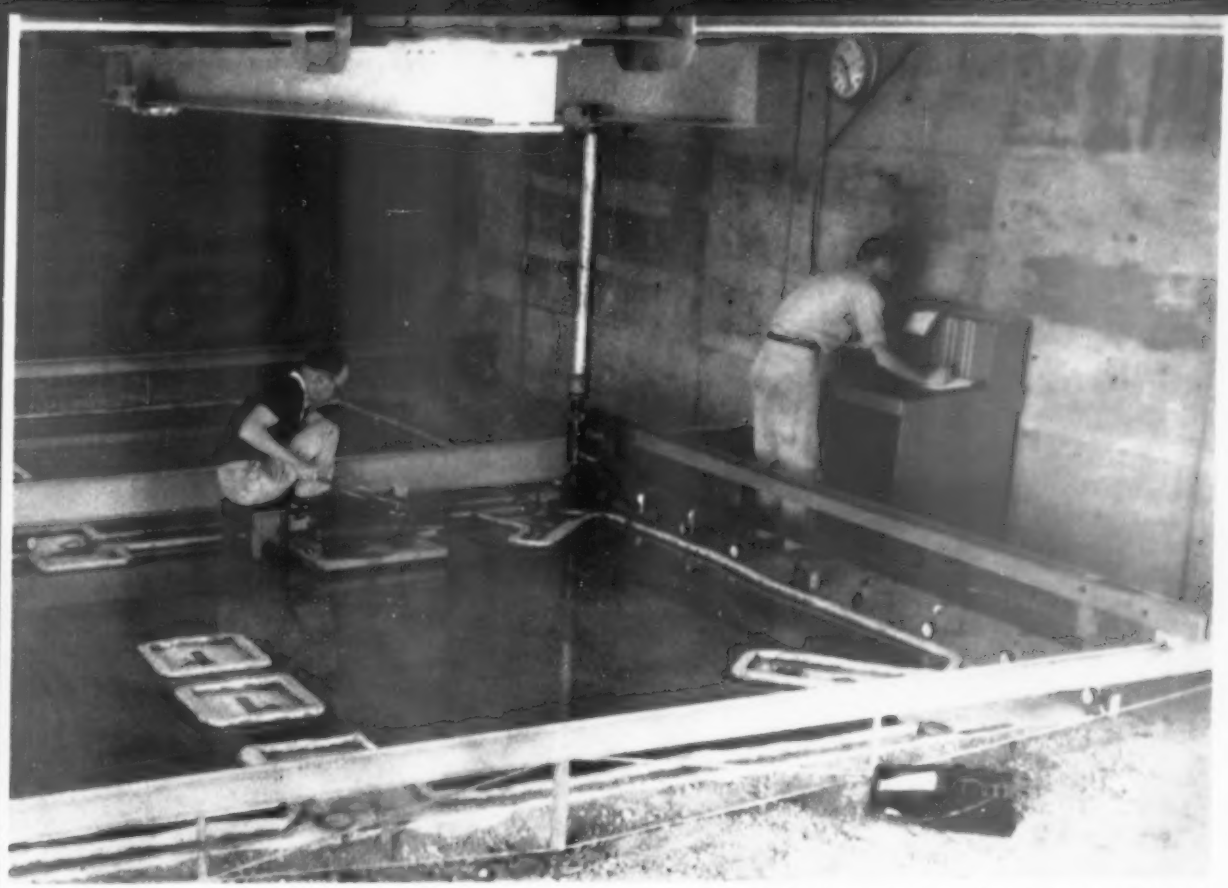
"We're

THE PRIMARY AIM OF RESEARCH as conducted by the Portland Cement Association is to find and interpret new facts relating to cement and concrete which may confirm or revise accepted theories or physical laws, and to put these new facts or theories to practical use.

Development differs from research in that it seeks to solve engineering problems by analytical and experimental work to the end that new products and improved practices relating to cement and concrete may be available for use in the field.

Specific investigations and studies currently under way or being planned for 1958 are about evenly divided in number and importance between Research and Development. In the field of concrete masonry, important work is being done and will continue as a responsibility of both Research and Development departments.

The perennial occurrence of cracking in concrete masonry walls is being attacked as a research



Load test on water-covered concrete pavement panels

solving tomorrow's problems"

problem and as a development project. In each instance the studies relate to volume stability. Research studies during the past year or more are reported to indicate that exposure to carbon dioxide in the atmosphere contributes to shrinkage of concrete masonry units which may lead to cracking. But intentional exposure of concrete block to carbon-dioxide gas after a brief hardening period is said to reduce susceptibility to moisture changes and result in a more volume-stable unit.

Development work toward the improvement of concrete masonry is also considering the matter of carbonation of concrete block. Shrinkage measurements have been made on block stored under various conditions. It has been found that block carbonate slowly in a normal atmosphere, according to laboratory reports, and that the shrinkage associated with this carbonation may amount to about 40 percent of the shrinkage formerly considered to be drying shrinkage only. The block carbonate readily in a high concentration of carbon dioxide, the report says, and the shrinkage which occurs in a few days amounts to about twice the carbonation shrinkage that occurs during a one-year exposure in a normal atmosphere.

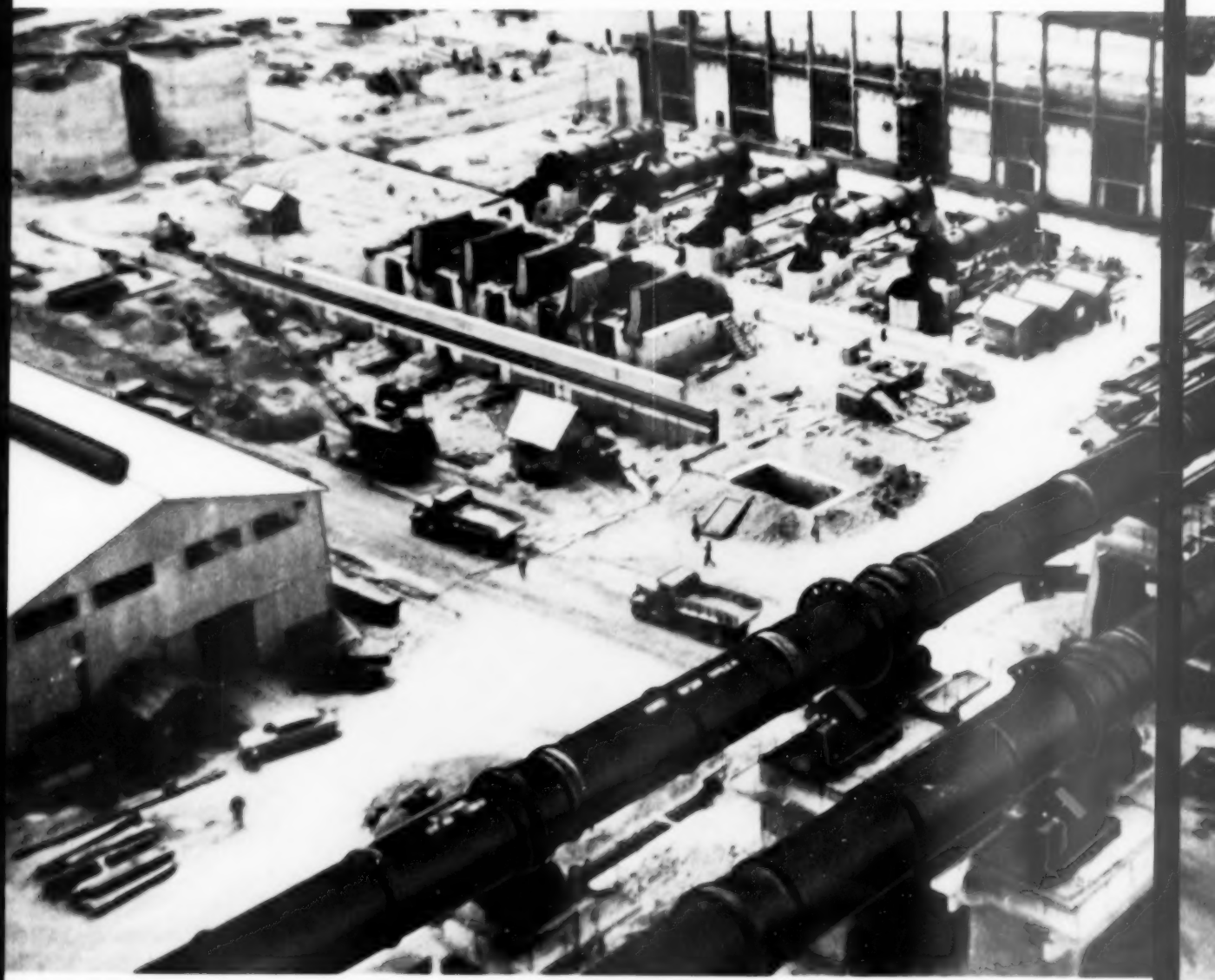
Further studies of volume stability of concrete masonry units involved measurements on two concrete block panels 20 ft. long and 12 ft. high during the past two years. All the block were dried to equilibrium with 50-percent relative humidity but the block for one panel were exposed to a concentration of 40-percent carbon dioxide for 18 hours. The panel built from the untreated block developed two to three times the shrinkage of the precarbonated block panel, the variation depending on the humidity when measurements were taken.

The Development department is also conducting studies and tests of the effect on strength and volume stability of type of aggregate and various holding and steaming cycles for high-pressure-cured block.

Please turn to page 124

ANOTHER KENNEDY A

Complete Cement
for GRESIK CEMENT

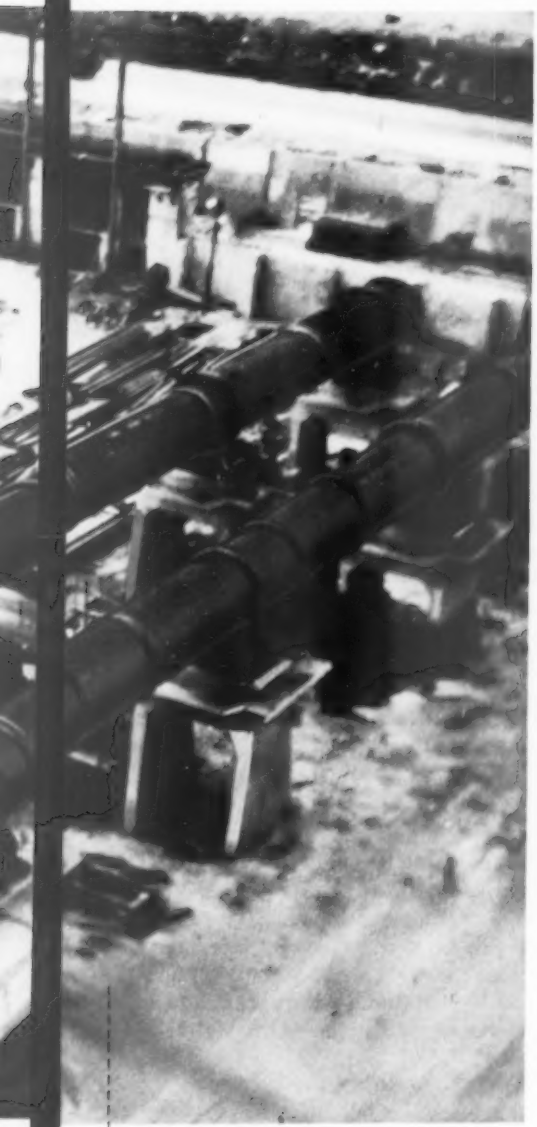


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COMPANY, Island of Java, Indonesia



Aerial view of Gresik Cement Company Plant, Island of Java, Indonesia

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- Classifiers
- Pneumatic Transport Systems
- Dust Collectors
- Complete Cement Plants
- Complete Lime Plants
- Waste Heat Boilers
- Pulverized Coal Firing Systems

NEW CEMENT PLANT OPENS IN INDONESIA

Special to The New York Times.

JAKARTA, Indonesia, Aug. 7 —Asia's most modern cement plant, an impressive example of Indonesian-United States cooperation, was formally dedicated today by President Sukarno in East Java.

The ceremony in the newly constructed industrial compound at Gresik, near Surabaya, represented an important event in the history of underdeveloped Indonesia, now struggling through her worst economic crisis. The cement plant, sprawling over several acres is expected to make a major contribution in helping strengthen the nation's economy and spur new industries.

From Gresik cement will be transported to scattered areas of the archipelago. Today's cement at Gresik will be tomorrow's new schools, houses, dams, hospitals, factories and bridges, all of which are badly needed by Indonesia's 82,000,000 people.

In a dedication speech, as reported here, President Sukarno thanked the United States for financial and technical cooperation in building the Gresik works.

Cement experts said the plant had a capacity of 250,000 tons of cement a year, about 75,000 tons more than total present production. They said the plant was expected to save Indonesia about $7,000 a day in foreign exchange.

Reprinted from
The New York Times, August 8, 1957

Send for Bulletins describing Kennedy Machinery and Equipment



Failure of vertical stacked bond concrete masonry wall under eccentric compressive test load

PCA's research lab

continued from page 121

In addition to the volume stability investigations the more important current projects of the Research department include the following: fire resistance of concrete, freezing and thawing tests, corrosion of prestressed wire in concrete.

Completion of the Association's new Fire Research Laboratory in 1958 will enable the Research department to step up the investigations of the fire resistance of concrete which have been in progress for some years. During the past three years analytical studies and laboratory experiments have been concentrating on the problem of the spalling of concrete. Present conclusions are that steam pressure in the pore spaces of the concrete is the chief cause of spalling when concrete is subjected to heat. Research is continuing toward a better understanding of the contributing causes of spalling. To this end studies will include steam permeability, thermal conductivity and heat capacity. Experiments are being carried out with a surface coating for concrete exposed to heat. One type of coating has been found which is applied as a decorative paint but which, when exposed to high temperatures, swells and is transformed into a cellular structure with considerable insulating value. Tests indicate, however, that such a coating will not prevent spalling of concretes which are especially susceptible to spalling. The endurance period of concrete specimens being tested has, however, been extended by about 15 percent through the use of the coating, in a number of the tests.

But the most urgent problem for the Association's Fire Research Laboratory is presented by prestressed concrete. It is becoming increasingly evident that the dearth of information on the behavior of prestressed concrete construction is a limiting factor in extending prestressed concrete construction. And up to the present time no fire test facilities adequate to handle large prestressed structural members have been available anywhere in the United States.

In readiness for a full-scale attack on the problem of fire resistance of prestressed concrete early in 1958, a number of prestressed beams are being cast in the laboratory. The start of tests depends on when the Fire Test Laboratory is completed but it is expected to be early in 1958. The fire investigation will give especial attention to the variables presumed to influence the behavior of prestressed beams and girders under fire exposure. These variables are:

(1) Thickness of concrete cover over the steel
(2) Aggregate quality and type
(3) Concrete strength
(4) Cross-sectional shape and mass
(5) Type of prestressing steel: twisted wire strand, separated wire or bar
(6) Bonded and unbonded steel, pretensioning and post-tensioning
(7) Age of member at time of test

The Research department also plans to complete a series of fire tests on conventionally reinforced concrete floors which was started at Underwriters' Laboratories, and to initiate a test program on the fire resistance of floors made with lightweight aggregates.

Another research project affecting prestressed concrete concerns the cause of corrosion of prestressing wire, rare instances of which have been reported. The object of this investigation is to determine the conditions under which corrosion of prestressing steel occurs in concrete and to

Please turn to page 128

LOOK TO DAYBROOK

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Illustrated—Daybrook Series 1050 Rock Bodies—Boulder Dam Type



Daybrook Rock Bodies and Hoists, long known for rugged dependability, now set a *new standard* of performance in quarry operations.

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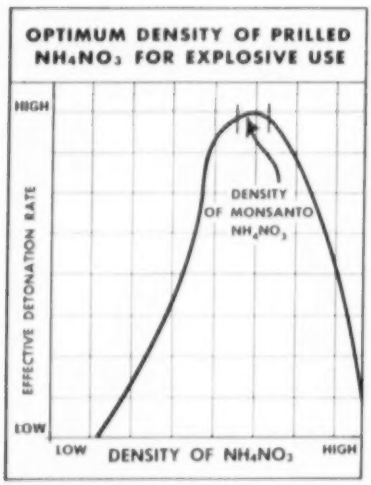
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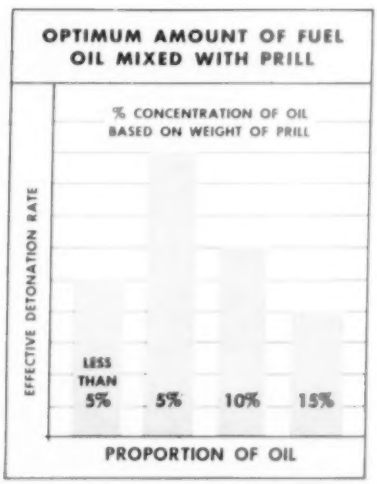
ANNOUNCING RESULTS OF USE OF AMMONIUM

Monsanto is the world's largest manufacturer of prilled ammonium nitrate—and the world leader in developing the use of NH_4NO_3 as an explosive for open work. Presented here is information about the new top-quality product that Monsanto research has developed to give you the optimum in savings, safety, speed, ease of handling: Lion Brand Ammonium Nitrate for use as an explosive.

MOST EFFECTIVE NH_4NO_3 FOR EXPLOSIVE USE







LION BRAND AMMONIUM NITRATE is produced according to the specifications determined by these findings of Monsanto research. Its prill size, density, and other properties are in optimum balance to give you the most effective performance when it is used as an explosive for open work.

MONSANTO RESEARCH IN NITRATE AS AN EXPLOSIVE

TYPICAL SHOT WITH MONSANTO PRILLED NH_4NO_3



View of area involved in the blast. Shot was made in heavy columnar basalt at dam site.



View at time of detonation. The system of detonation recommended by Monsanto, in conjunction with Monsanto's ammonium nitrate, will yield equivalent pound-for-pound results with 60% gelatin dynamite at one-fourth the cost.



Results of blast. The powder factor in the shot above was 0.4 pounds per cubic yard. Breakage of rock was considered ideal by contractor.

Photos courtesy of Morrison-Knudsen Co., Inc.

IMPORTANT FACTS ABOUT MONSANTO EXPLOSIVES SERVICES

1. Leadership in ammonium nitrate explosives research now makes Monsanto the source of newest information in this field.

2. A report presenting the latest research findings on the use of ammonium nitrate as an explosive—given by Monsanto to the Mining Society of AIME, October 1957—is available upon request.

3. Monsanto's experienced staff can give you the finest, most complete technical service. The benefit of this experience is available to you. Just phone Monsanto.

4. Monsanto's Lion Brand Ammonium Nitrate is immediately available to meet your needs. Monsanto is the world's largest manufacturer of prilled ammonium nitrate.

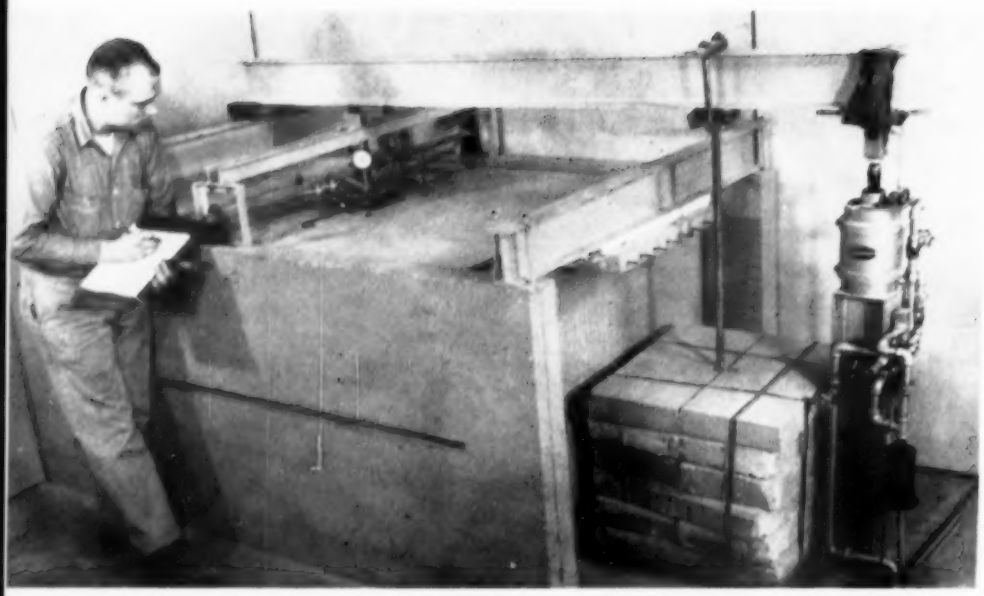
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Laboratory apparatus for applying repetitive load to pavement slabs

PCA's research lab

continued from page 124

find means of preventing it. The work was started in 1956 and is being continued. A progress report says that corrosion has occurred in laboratory specimens, "only, but not always, when calcium chloride or sodium chloride was used in the mix." Tests are continuing to determine also whether shrinkage cracks in the concrete contribute to corrosion.

Studies relating to the influence of air entrainment on the frost resistance of concrete have been carried on since the first application of air entrainment. Now research on the influence of air void characteristics and other variables affecting frost resistance is being furthered in order to obtain sound engineering information. These studies are linked closely to salt-scaling of concrete pavement and investigation of the many chemical de-icers appearing on the market. A number of these de-icers have been tested during the year with relation to their effect on concrete with or without air entrainment.

Also relating to the durability and scale-resistance of concrete pavement, the Research department has been making tests of the effect of sprinkling a concrete pavement surface before finishing. It was indicated that light sprinkling had no adverse effect but that heavy applications of water lowered the resistance to salt-scaling.

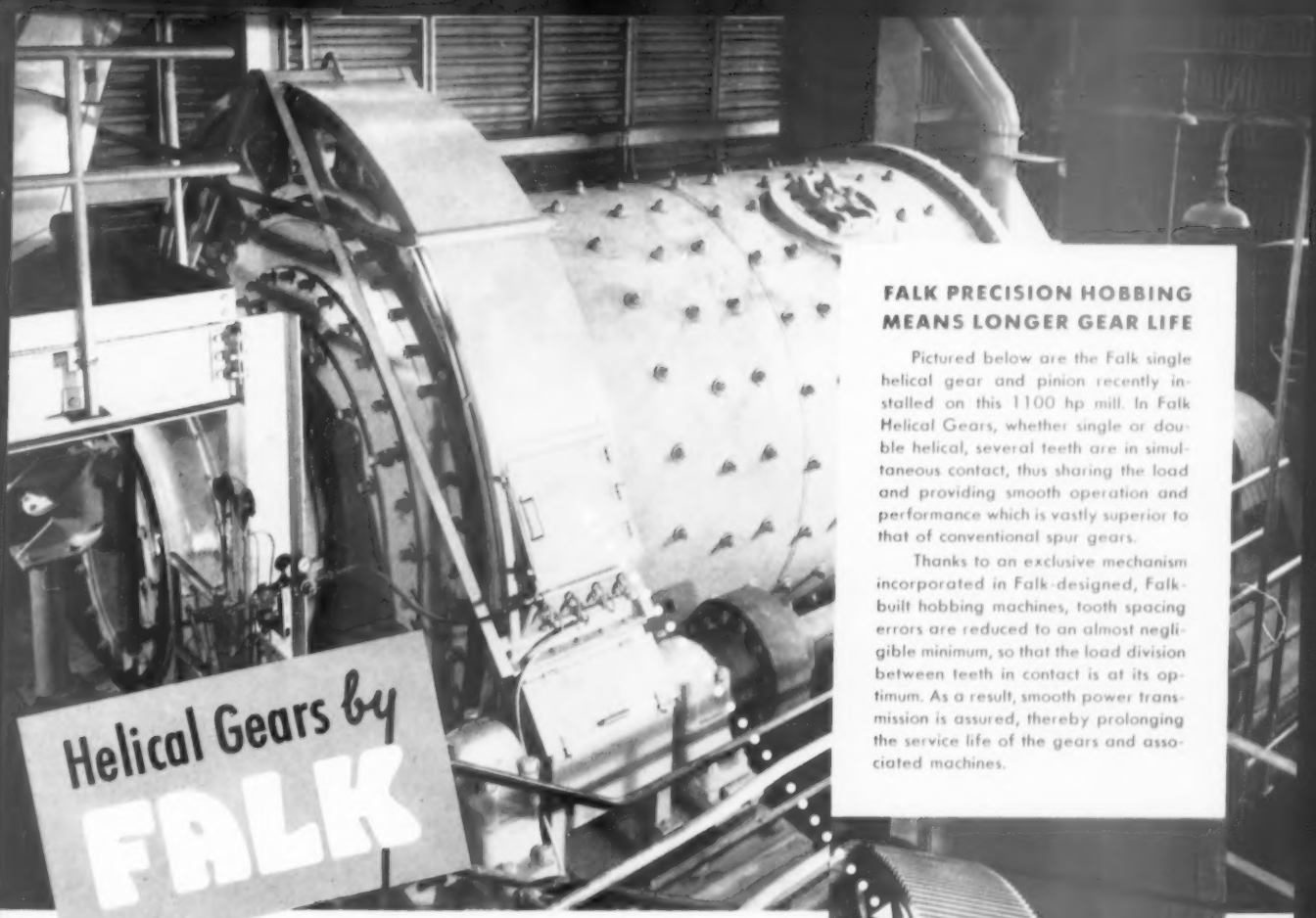
Development department projects in addition to the work done on concrete masonry jointly with the Research department include: Concrete pavement design and maintenance, Soil-cement investigations, Development of structural concrete, Lightweight aggregate concrete, Architectural concrete panels.

The studies relating to concrete pavement design are intended to obtain more accurate knowledge of the influence of thickness and quality of granular and soil-cement subbases on the performance of a pavement; to determine the relative effectiveness of various methods of obtaining load transfer at joints and also to obtain further information on joint sealing materials. The over-all objective of this work is the development of more economical pavement designs. Visual observations and measurements of pavement performance have been made during the past several years on the Indiana and Ohio test roads.

Loading tests on 12 x 18-ft. pavement panels, 8 in. thick, were made in the laboratory during

Please turn to page 132

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Helical Gears by FALK

FALK PRECISION HOBBING MEANS LONGER GEAR LIFE

Pictured below are the Falk single helical gear and pinion recently installed on this 1100 hp mill. In Falk Helical Gears, whether single or double helical, several teeth are in simultaneous contact, thus sharing the load and providing smooth operation and performance which is vastly superior to that of conventional spur gears.

Thanks to an exclusive mechanism incorporated in Falk-designed, Falk-built hobbing machines, tooth spacing errors are reduced to an almost negligible minimum, so that the load division between teeth in contact is at its optimum. As a result, smooth power transmission is assured, thereby prolonging the service life of the gears and associated machines.

...your Best Buy in gears!

In these times of industrial expansion and modernization, Falk Helical Gearing is more than ever the first choice of experienced, economy-minded users of gear-driven equipment.

This increasing preference is the result of proved performance. Falk Helical Gears and Pinions provide *better performance over a longer service life* because they are correctly engineered...their accurately generated teeth have extra depth and extra capacity...gear efficiency, as shown by actual test data, is 98 + %...the highest you can buy!

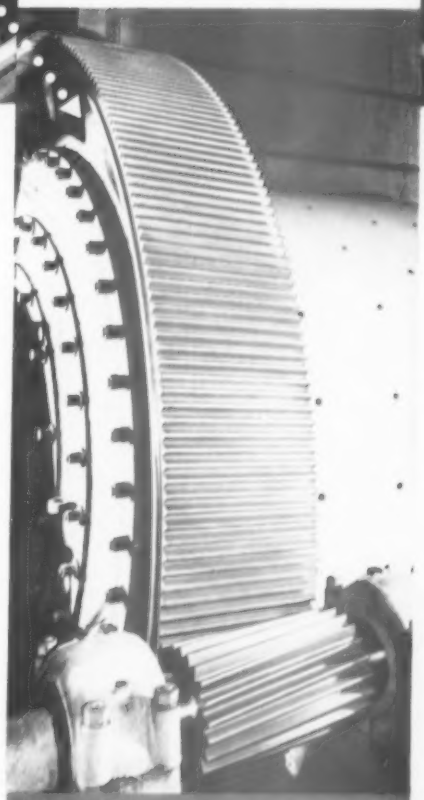
Other superior features include: high reduction ratios which permit use of higher motor speeds for greater efficiency and reduced power costs; maximum resistance against abrasive wear; smooth, helical gear action. All these factors contribute to the long service life of trouble-free operation for which Falk gears are famed the world over.

When expanding or remodeling your production facilities, it pays to remember that the performance of your equipment will not be any better than the performance of the gears that drive it. So, if uninterrupted production is important to you, specify Falk Helical Gears. They're available in sizes up to 18 ft. in diameter...in capacities up to 2000 hp.

Consult any Falk representative—also, write for
Engineering Report 6170, "Advantages of Helical Gearing."

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New 225-net-hp turbo-engine

New weight — 45,500 lb (bare)

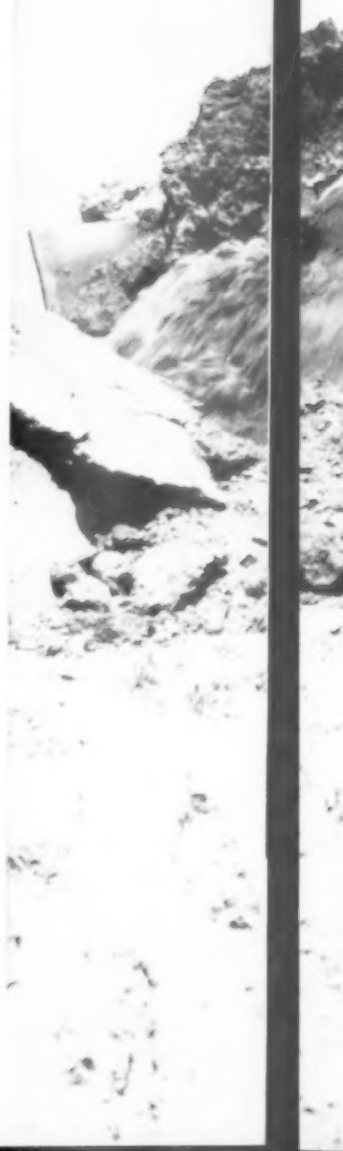
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New operating ease and control with work-saving decelerator

New heavy-duty matched dozers

Here's a big tractor you can depend on to help you on a wide range of stripping and maintenance jobs. Your Allis-Chalmers dealer will be glad to talk to you about the new "21" . . . and to prove its value in a working demonstration on your job. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.



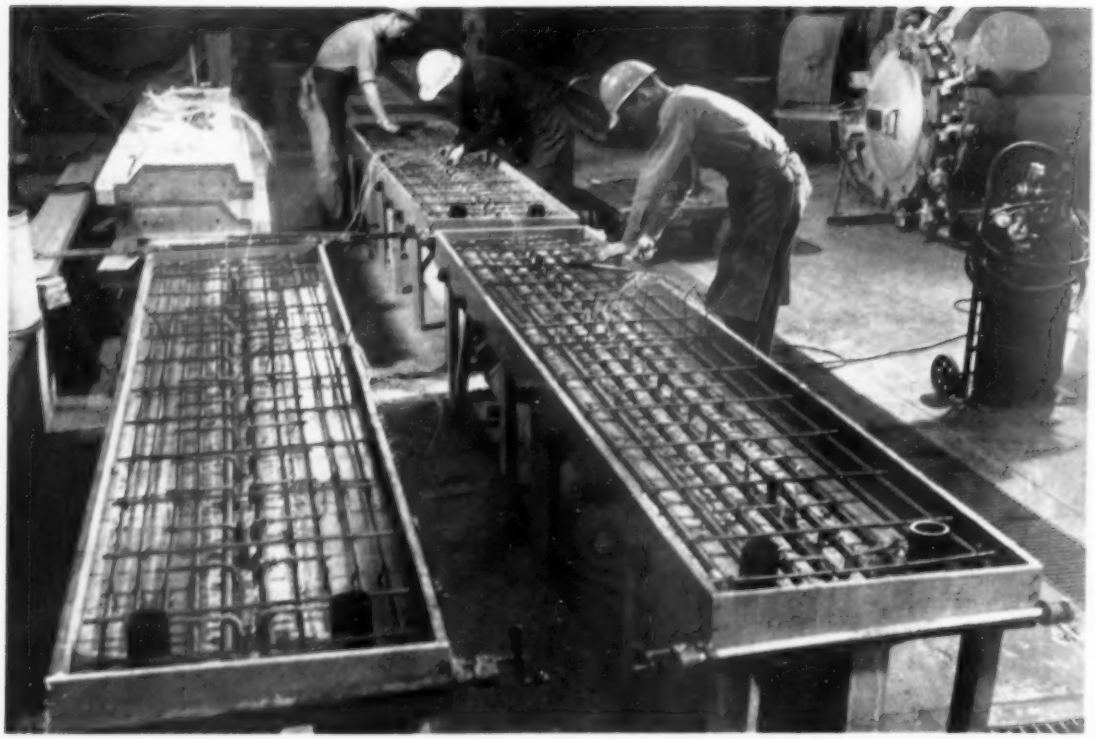
ALLIS-CHALMERS

Engineering in Action

TODAY'S BIG-TRACTOR JOBS!



NEW HD-21 IN ACTION with new 15-ft angle-dozer; approximate total weight, 56,225 lb.



Forms being prepared in the lab for casting deck slabs for prestressed concrete bridge girders

PCA's research lab

continued from page 128

the year and are continuing. These panels are built in pairs on clay subgrades with granular subbases of various materials placed in different thicknesses. The most recent tests were on panels over open-textured, free-draining sand and gravel subbases built in 5, 10 and 15 in. thick layers. Previous tests were run on dense-graded sand and gravel subbases. Results indicated that granular subbases reduce deflection of pavement but do not greatly reduce the stresses or strains.

A second series of laboratory tests are based on the performance of panels on granular and soil-cement subbases under as many as 500,000 cycles of repetitive loading. Data obtained indicates that granular subbases should be compacted to relatively high density during construction to eliminate detrimental densification under traffic; that open-textured subbases have some superiority if there is no intrusion of the subgrade; that subbases of some material as thin as 2 in. are effective in preventing pumping and that performance of sand soil-cement is excellent.

Laboratory work done by the Development department was the basis of successful application of old concrete at Selfridge Air Force Base, Mt. Clemens, Mich. during 1956. Additional resurfacing projects are planned. In the same field of investigation, laboratory studies are being made of the effect of adding resin and rubber latices to concrete. This is part of a search for new materials suitable for thin resurfacing, patching and joint repairs.

Both laboratory and field testing are continuing in a search for an improved joint filler. Many new materials are at present under test in pavements in service.

The Development department is also cooperating closely with the American Association of State Highway Officials and the Highway Research Board on the twenty million dollar test road near Ottawa, Ill.

Studies and tests are being conducted by the Development department to find out the elastic properties and strength of several different mixtures of soil-cement. This information is needed for the development of a rational design of soil-cement roads and of base courses for roads and runways.

Please turn to page 190



500′ (IN 30′ DEPTHS) PER 8-HOUR SHIFT in limestone, with 2 heavy-duty wagon drills and efficient Jaeger "600" air power. Drilling is done in 2 lifts, first to 20′, then a final 10′ lift. Lewisburg Limestone Co., Lewisburg, Tenn.

Jaeger 600 "far more efficient", *says quarry operator*

Powers 2 heavy-duty drills averaging 500′ per shift in limestone; engine speed under 1650 rpm

It takes plenty of constant 100-lb. air to power 2 heavy-duty wagon drills logging a fast 500′ in limestone, each 8-hour shift. This Jaeger "600" rotary does the job for Lewisburg limestone, with ample air reserve, at easy, fuel-saving speeds that never reach 1650 rpm. This economical, slow-running performance cuts fuel costs, saves wear and tear on engine and compressor. "Far more efficient than the compressor it replaced," reports Lewisburg Limestone.

A Jaeger Roto "600", using the same Model 6-71 GM diesel engine, produces the same 600 cfm of air as other "600" compressors at 100 to 150 rpm slower speed (1650 rpm instead of 1750 or 1800). You cut fuel costs, reduce fpm of engine piston travel and save up to 9000 revolutions every hour you operate a Jaeger "600". Smaller Roto Air-Plus® units (125, 250 and 365 cfm) have the same slow-speed, high-efficiency performance.

It will pay you to get full details and prices from your Jaeger distributor — or ask us to send Catalog JCR-5.



MAKING LITTLE ONES OF BIG ONES: Jaeger "125" rotary keeps this hand-held rock drill operating at full efficiency by producing 125 cfm of 100 psi air at only 1700 rpm, instead of the usual 1800. You save the difference, in fuel and wear.

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1 1,790,000 lb. charge of Amocol ammonium nitrate blasting agent primed with 60% Extra dynamite erupts with controlled violence to break and displace over 2,500,000 cubic yards of quartzite, the largest industrial blast in the nation's history.

Making mincemeat out of a mountainside . . .

THIS BLAST BROKE ALL RECORDS!

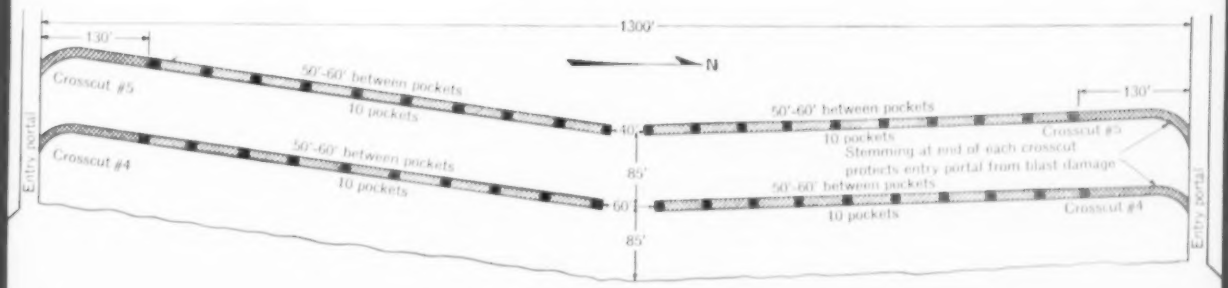
Two-and-a-half million cubic yards of rock broken by one construction blast! That's the record-smashing result achieved this summer at Little Valley, Utah, in the world's largest non-atomic blast.

Morrison-Knudsen Company, Inc., scored this industrial record with 1,790,000 lbs. of Atlas Amocol blasting agent and Atlas 60% Extra dynamite, detonated in two 1,300-foot coyote crosscuts driven from permanent entry portals (see sketch).

M-K engineers directing this project estimated that the blast produced over a tenth of the rock needed for the 13-mile causeway being built for the Southern Pacific railroad across the Great Salt Lake at Promontory Point.

Atlas is proud of the part its products and technical assistance played in making this historic blast a success.

EXPLOSIVES DIVISION
ATLAS POWDER COMPANY
WILMINGTON 99, DELAWARE
offices in principal cities



Plan of portals and crosscuts 5′ x 7′

Height of burden from floor of crosscuts 200′

■ Explosives pocket

▩ Sand stemming

Amount of explosives used:	
Atlas Amocol	1,432,000 lb.
Atlas 60% Extra dynamite	358,000 lb.
Total	1,790,000 lb.
Amount of rock produced	2,500,000 cu. yd.

2 The two 1,300-foot coyote crosscuts were fired 25 milliseconds apart with Rockmaster electric blasting caps attached to the detonating fuse connecting individual charges within each tunnel. The crosscut nearest the face was fired first to provide relief for the second.

3 Muckpile shows uniform breakage and excellent displacement. Nearby buildings and equipment are untouched by throw. Only blast damage was to adjacent power and telephone lines which were purposely allowed to remain in shot area to minimize replacement costs. The rock will provide solid fill for causeway and also will be used as riprap in final stage of construction.





Drill bits wear rapidly from continuous contact with the hard, abrasive rock

Producer digs out some new markets for quartzite rock

By ELWOOD MESCHTER

NO COMMON ROCK MAKES A better aggregate, road stone or building stone than quartzite. But the very properties that make it a premium material make it virtually impossible to process efficiently. It is hard rock, resisting drilling and blasting, heavy to load out and haul, tough and elastic to resist crushing, and sharp and abrasive to tear the guts from processing machinery.

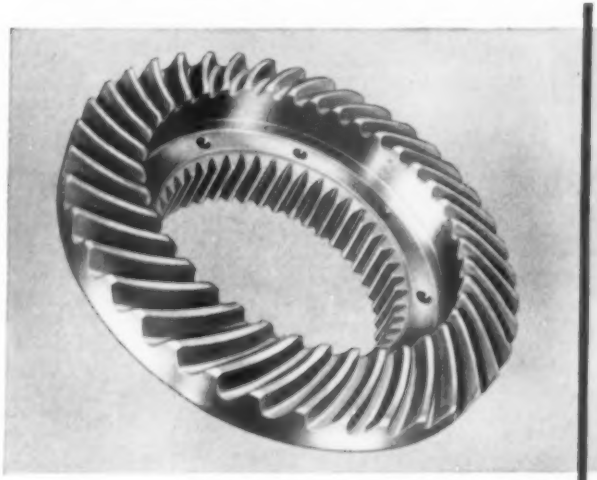
The markets for quartzite have been limited to jobs no other stone could do; jobs which could pay the cost to produce it. Quartzite is used as building stone, as the abrasive "pebbles" in grinding mills and as raw material for silica refractories.

Quartzite outcrops in southern Minnesota at New Ulm, where it is known as "redstone." Here a quarry of massive Sioux quartzite has been tooled out intermittently for more than 50 years to make road stone and aggregates for local use. High production costs to process the hard stone and competition from softer rock eventually defeated each operator.

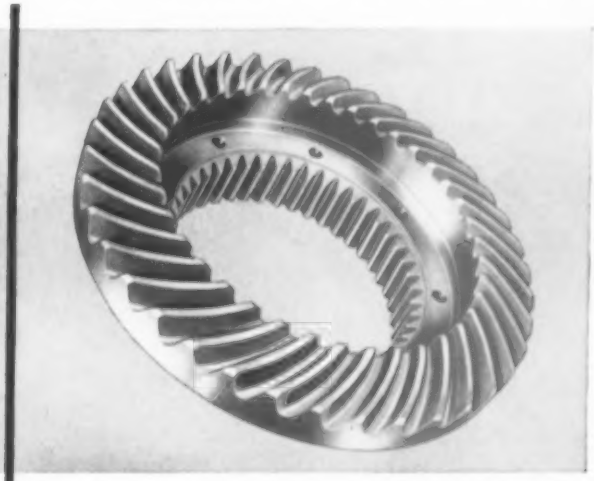
This quarry was a challenge to Edward Lundin, a contractor from nearby Mankato. He knew that there were many uses and profitable markets for quartzite products for anyone who could lick their difficult processing problems. Difficult problems and hard work were not new to Mr. Lundin, who as a contractor for many years had handled tough jobs in all parts of the country. For more than a year his New Ulm Red Stone Quarry Co. has been producing many sizes of grade A aggregates and quartzite products. Its business has been increasing and many production problems have been overcome successfully.

Please turn to page 138

They May Look Alike . . . but they're Not!



Replacement Ring-Gear
Made by Eaton—Axle Division



Replacement Ring-Gear
Not Made by Eaton

Only Genuine Eaton Axle Service Parts are Identical to the Original Production Components

Even Eaton Axle parts may wear out and require replacement. When this happens it is important that repairs be made with Genuine Eaton Axle Service Parts. They are identical to the original production components in design, metallurgy, heat treatment, and quality of finish—made to run together with the other axle parts. Eaton replacement parts are held to the rigid quality standards established for axle components and will deliver the same dependable, low-cost kind of service. So when, after thousands of miles of trouble-free operation, it may become necessary to replace worn parts in an Eaton Axle, it's most economical to make these replacements with Genuine Eaton Axle Service Parts.

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Loading out at the quarry

New quartzite markets

continued from page 136

Mr. Lundin has many advantages that the former owners and operators of the New Ulm Quarry lacked to operate profitably. He was able to buy the most modern crushing and screening equipment, and he budgeted for heavy maintenance expense. In addition, he knew that all of the products of the operation must be sold at a profit, rather than the one or two sizes which were easiest to sell.

The success of his operation so far has been due in great measure to his success in finding new and unusual uses for quartzite products. In this way the market has been diversified, and the demand broadened. He does not depend on any single customer for the bulk of the business, and he has been able to achieve a profitable product mix.

The quarry itself is in a deep ledge of reddish, almost lavender colored quartzite underlying about 300 acres near New Ulm. The rock is metamorphosed sandstone—hard and crystalline, averaging more than 97 percent silica. Once a month blasting brings down the rock in well shattered blocks. A shovel works a 45-ft. face and loads out trucks for the short haul to the crusher hopper.

Shot rock is dropped into the crusher hopper equipped with an apron feeder and bar grizzly ahead of an impact crusher. The grizzly takes out minus 4-in. stone and drops it to the main inclined belt conveyor; the plus rock is crushed before it drops to the belt. An impact type primary crusher was selected because it yields a more cubic product with the particular quartzite mined in Ed Lundin's quarry.

Crushed stone is conveyed from the impact crusher to the top of the screening tower where a pair of three deck vibrating screens prepare four sizes of material for truck shipping bins. These sizes are usually 4 x $^3/_4$ in., 7/16 in. x 4 mesh, 4 x 10 mesh and through 10 mesh. However, the sizes can be easily varied by changing the six screen

Please turn to page 140



CAST BUCKETS are also available in longer-lasting Promal for longer life under severe abrasive conditions

Select your cast elevator bucket from

LINK-BELT's complete long-life line

Greater efficiency . . . longer bucket life . . . fewer shutdowns—you get all these benefits when you choose the Link-Belt cast bucket that matches your elevator and the materials you handle. They're available in six styles—each in a full range of sizes to meet capacity requirements.

Smooth surfaces, well-rounded corners and proper proportioning assure quick filling . . . fast, clean discharge. In addition, Link-Belt buckets are cast from high-grade malleable iron . . . reinforced at points of greatest stress to resist wear and distortion. For facts on the type and size that's best for your operation, see your Link-Belt office or authorized stock-carrying distributor. Or write for your copy of Book 2465.

LINK-BELT

CAST ELEVATOR BUCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock-Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville (Sydney), N.S.W.; South Africa, Springs. Representatives Throughout the World. 14.7251

STYLE A



This type is used on elevators handling coal, cement, chemicals and similar materials.

STYLE AA



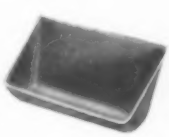
Designed to handle same materials as Style A buckets. Has reinforced lip for added wear life.

STYLE AA-RB
(Reinforced Back)



Elevate same types of materials as Style AA buckets. Designed for extra-heavy service conditions.

STYLE B



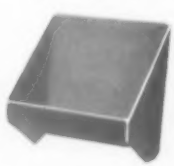
These buckets are used extensively for handling coke, ores, stone and similarly coarse materials.

STYLE C



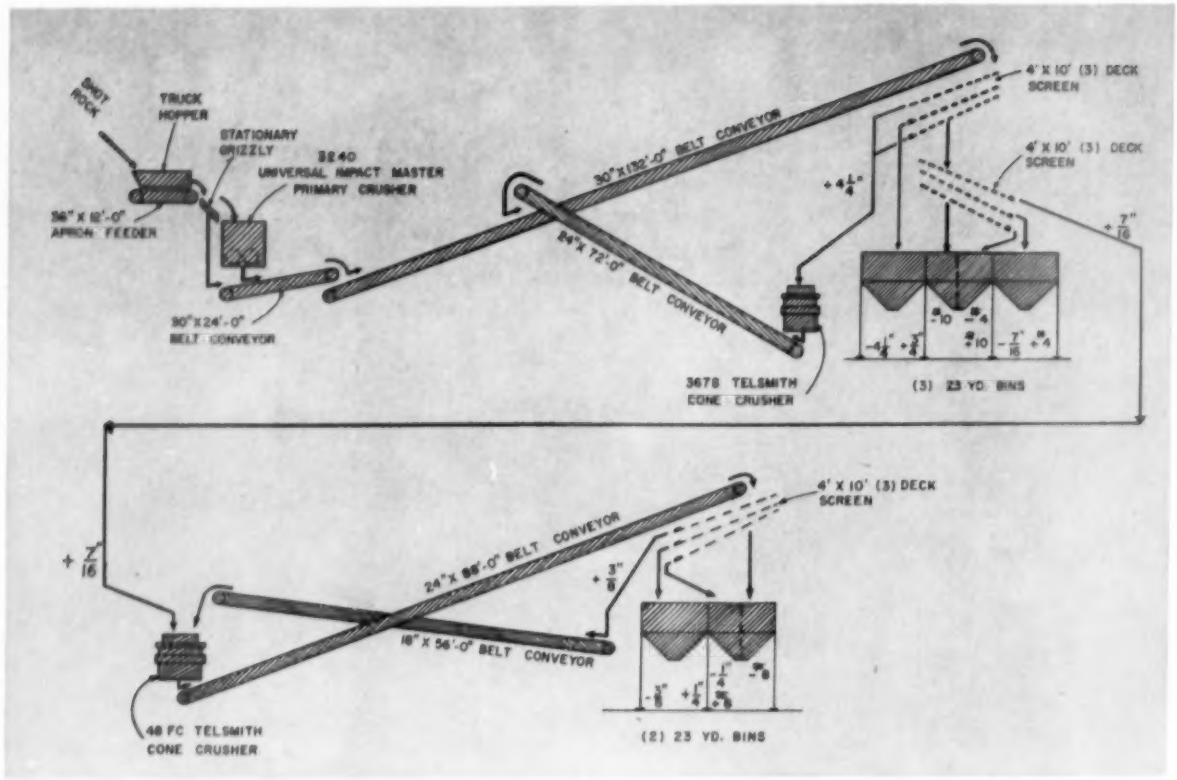
Designed for handling clay, salt, finely pulverized ores, and other sticky materials.

CONTINUOUS



Used for clean, gentle handling of coal, sand, gravel, crushed stone and other dry materials.

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Flow diagram of crushing and screening operations

New quartzite markets

continued from page 138

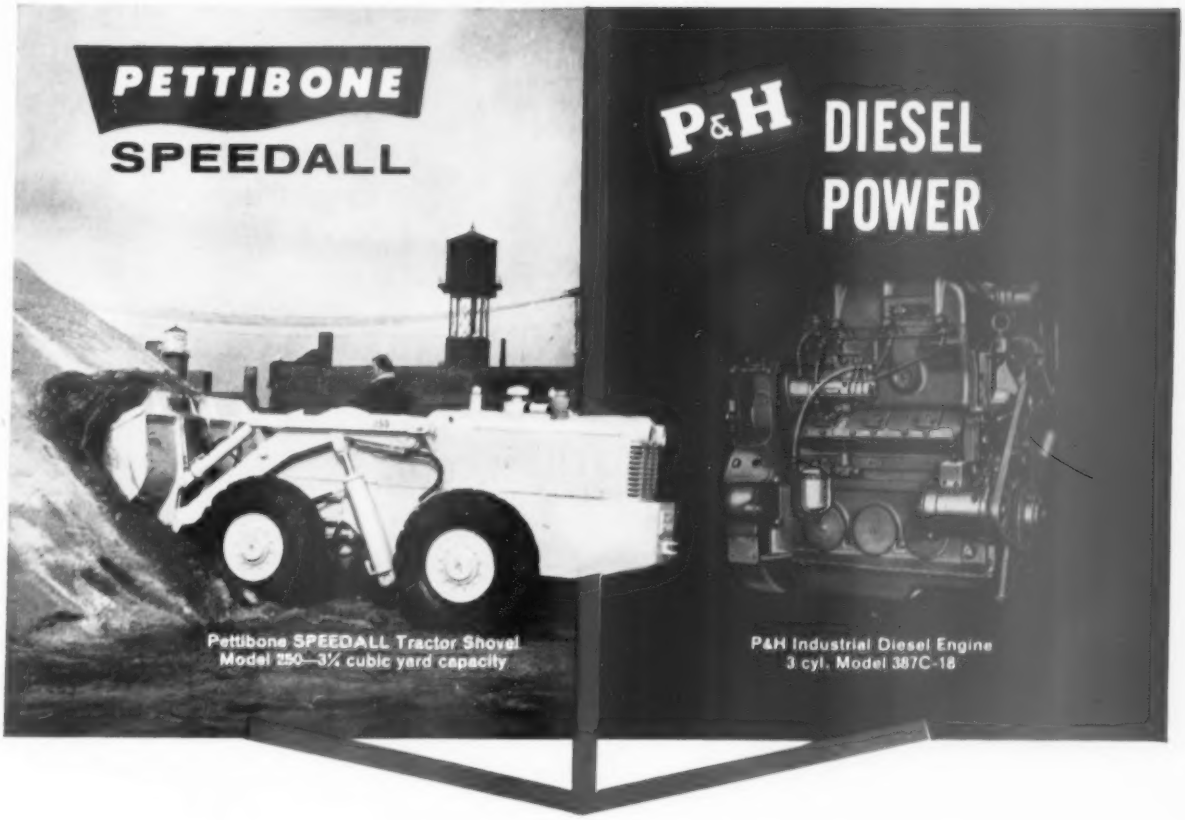
cloths to meet the specification of almost any market requirement.

The plus 4-in. size from the top of the upper screen is dropped to a 3-ft. shorthead cone crusher and the product carried to the main inclined belt conveyor and recycled to the screens. Oversize from the top deck of the lower screen is dropped to a 4-ft. shorthead cone crusher where it is reduced to minus $^3/_8$ in. This product is conveyed to a three-deck screen over shipping bins where three sizes are produced for shipment. The oversize from this screen is taken back to the 4-ft. crusher and recycled. The three sizes normally made are $^3/_8$ x $^1/_4$ in., $^1/_4$ in. x 8 mesh and minus 8 mesh.

Highway construction takes most of the quarry's output. Hard, tough quartzite makes the most durable kind of concrete; it is ideal for base course, finish course, and seal coat for asphalt pavement; it is unsurpassed as fill or base course for heavy-duty, all-weather unpaved roads. Busy, energetic Ed Lundin keeps on top of this highly competitive exacting market at all times during the road building season.

He still takes time out to sell his other sizes of rock, particularly the larger sizes. "The more of the big stone we can sell, the less work the crushers have to do and the more tonnage we can get out," he says. One of the best applications for 4 x $^3/_4$-in. rock is for filter beds in many of the new water and sewage treatment plants being built all over the midwest. The hard stone resists the attack of bacteria and the corrosive attack of powerful organic acids which destroy softer and more reactive rock. Quartzite commands a premium for this service because it lasts many times longer than other materials, but its very hardness and durability limits the replacement market to once every 30 to 40 years.

Please turn to page 142



the best combination for

EXTRA POWER .. EXTRA PRODUCTION

Here's how to make a good machine better! Specify Pettibone SPEEDALL Model 250 *powered with a P&H Diesel.*

A responsive engine with high torque and lots of reserve strength, the P&H Diesel supplies power to handle heaviest digging at a high rate of speed—to handle peak loads without stalling. Downtime for restarts, servicing and repairs is held to a minimum.

The P&H Diesel provides other profitable performance features:

- **Faster Starts**
- **Better Idling**
- **Lower Fuel Cost**
- **Compact Design for Easier Maintenance**
- **Smaller Parts Inventory**

Efficiency and simplicity of P&H Diesel design assure lowest operating and maintenance costs. The P&H Diesel operates economically on low cost No. 2 diesel fuel. It has 25% fewer parts. All wearing parts are interchangeable.

Specify the P&H Diesel for all your construction equipment. For additional information on P&H Diesel powered SPEEDALLS see your Pettibone dealer or write for Bulletin Z-26.

HARNISCHFEGER

P&H DIESEL ENGINE DIVISION, Crystal Lake, Ill.

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Material is carried here via conveyor belt from primary crusher to main screening



Secondary crusher to secondary screening

New quartzite markets

continued from page 140

There is one market where the "replacement demand" is terrific—turkey grit. Turkey growers now know that gobblers grow faster with craws full of $\frac{3}{8}$ x $\frac{1}{4}$ in. redstone chips. This fact has opened up a new and expanding market for hundreds of tons of quartzite each year. Minnesota is a wonderful country for raising turkeys the year round; as more are raised each year the quarry's output of grit will soar.

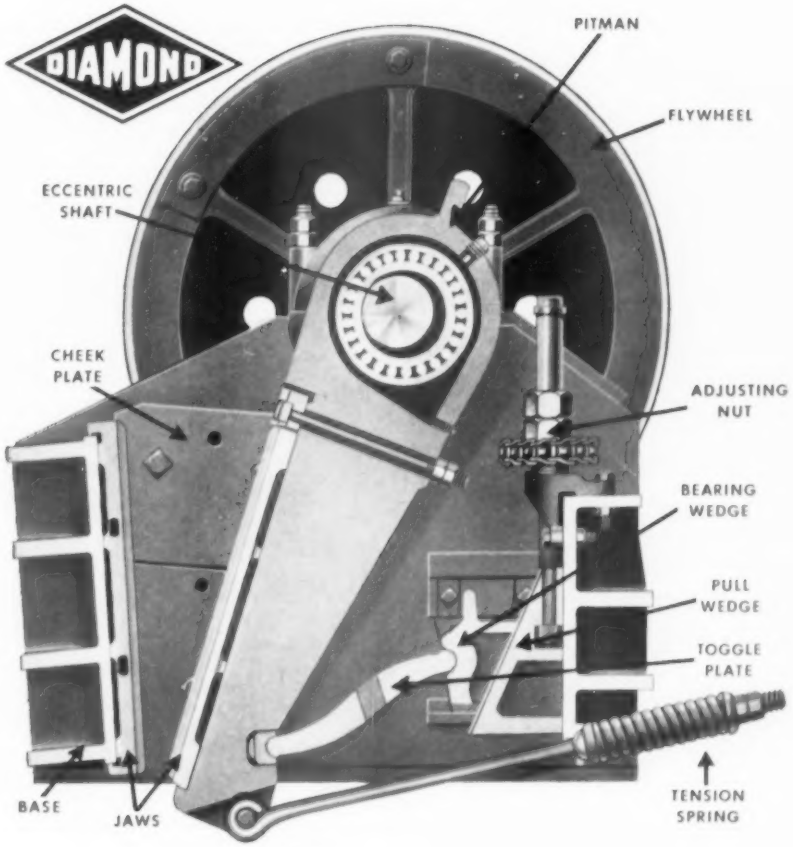
Not all marketing problems are under control, by any means. As a new market is found for any size of rock, another size appears as a by-product. Then a market must be found for this material to avoid the accumulation of costly, space consuming inventory.

Right now the minus 8 mesh and minus 10 mesh fines are moving slowly. A small but steady outlet has been found to supply the mud saws of Minnesota's granite cutting industry. Many of these saws used imported abrasives, but have now changed over to use the Red Stone Quarry's fine, abrasive silica sand. There is very little opportunity for any vast increase in consumption in the

Please turn to page 200

EQUIPMENT USED AT NEW ULM

Compressor	Gardner-Denver Co.
Drilling equipment	Gardner-Denver Co.
Dynamite, Gelodyn No. 1	Atlas Powder Co.
Trucks	Dodge Div., Chrysler Motor Corp.
Shovel	Lima Works Div., Baldwin-Lima-Hamilton Corp.
Cone crushers	Smith Engineering Works
Tractor shovel	Mixermobile Manufacturers
Scales	Thurman Machine Co.
Layout and design	Universal Engineering Corp.
Impact Master primary crusher, conveyors, chutes and bins	Universal Engineering Corp.



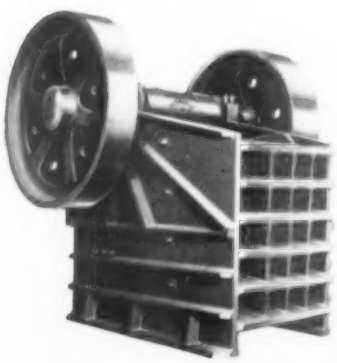
Diamond's long-jaw design gives maximum uniformity with hardest rock

Diamond's long-jaw design handles the hardest rock with ease, breaks it down into uniform sizes. Crushing cycle is positive and uniform. A quick jaw opening permits fast feed and discharge. Discharge opening can be made smaller or larger as desired while the crusher is in operation.

Diamond jaw crushers can really take it, too. Pitman, jaws and bearings never flinch at the crash-bangs of rock crushing. Pitman operates on a forged steel shaft and supports the movable jaw. Jaws are extra long manganese steel, reversible for longer service and easily changeable. A DOUBLE ROW of adjustable Timken bearings for both main and pitman bearing assemblies carries the heaviest radial and thrust loads—a Diamond exclusive.

As rugged as their job is, records in hundreds of pits, quarries, construction jobs, prove that a Diamond jaw crusher is a top performer. Its ability to keep screens full and bins loaded—to take rough punishment—and to produce greater tonnage per square foot of jaw area makes it a profitable investment.

If it's your responsibility to see that aggregate production costs are kept down, you'll want to get complete details on Diamond jaw crushers . . . no obligation.



A 36 x 48 Overhead Eccentric Jaw Crusher.

Other sizes available:

6 x 12	15 x 24
10 x 16	15 x 36
10 x 20	20 x 36
10 x 24	24 x 36
10 x 36	30 x 42

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Work bridge—spillway cofferdam

New dam gobbles up sand, gravel at furious pace

By WALTER B. LENHART

TWO MILLION CUBIC YARDS of sand and gravel are going into Priest Rapids Dam, the latest in a series of power-harnessing giant dams to be built on the Columbia River in Washington. Let entirely to the Merritt-Chapman and Scott Corporation for $91,880,625, the project represents one of the largest single contracts in construction history. Scheduled for completion by September 22, 1961, construction is already well under way.

The privately financed dam, one of a pair being built by the Grant County Public Utility District (PUD), is below three others on the upper Columbia: Grand Coulee, Chief Joseph and Rock Island. It is just north of the Hanford Works U.S. Atomic Energy Commission Reservation and the army's Yakima Firing Range. Engineering studies and designs for both Grant County dams are being done by Harza Engineering Co. of Chicago.

The dam is to run 9,312 ft. straight across the river. Of this length 2,427 ft. is a concrete gravity-type structure, of which 1,142 ft. is concrete spillway, 1,025 ft. is taken up by powerhouse and assembling bay, 260-ft. non-overflow gravity dam and the remainder is earth fill. Fish ladders are provided, but there are no locks for navigation. If locks are ever needed, construction plans are such that they can be built without interrupting power operations.

The aggregates plant, built on the bank near the construction site, turns out both sand, gravel and a so-called "transition" material—a minus ¾-in. sand-gravel used as core in the earth-fill structure to facilitate drainage of any water seeping through. This material is taken out at the first screening operation with wet screens, using only enough water to make it damp.

Please turn to page 146





San Andreas, California . . .

another example of the cost-cutting features that bring repeat orders for Bucyrus-Erie rotaries

On the strength of the performance records of a Bucyrus-Erie 50-R rotary blast hole drill placed in operation in 1954, the Calaveras Cement Company recently installed a new Bucyrus-Erie 40-R drill at its No. 1 quarry near San Andreas, Calif.

The 40-R is drilling 9-in. holes through limestone to an average depth of 70 feet. Even though this rig has been operating only a short time, the drill operator reports the 40-R is "doing a fine job." Calaveras Cement is believed to be the first cement company in the West to convert completely to rotaries — all Bucyrus-Erie.

Among the many reasons for the outstanding success of these drills are: rotary drive with Ward Leonard electric control of rotating speed; hydraulically powered pulldown force; remote-controlled power-driven tool handling unit; and air blast cleaning of drill holes.

Two models are available — the 40-R for drilling 6¾- to 9-in. holes, and the 50-R for drilling 9⅞- to 12¼-in. holes. Holes can be drilled continuously for 32 ft. 9 in. (50-R) and 27 ft. 9 in. (40-R) before an additional pipe section has to be added.

Bucyrus-Erie rotaries can speed your drilling operations . . . cut your drilling costs. Write direct for detailed, illustrated literature.

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A Familiar Sign . . . BUCYRUS ERIE *. . . at Scenes of Progress*

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN



Stacker belt in foreground is for minus ¾-in. sand-gravel used as core in earth fill portion of dam to facilitate drainage through the embankment



Concrete batching facilities are shown at right. Excavating behind cofferdam is at left

New dam gobbles sand

continued from page 144

The plant produces four sizes of aggregates, ranging from 3 x 6 in. to No. 4 x ¾ in., and a concrete sand in addition to the transition material. All five concrete aggregates are stockpiled over a tunnel in which a 30-in. reclaim belt operates to serve a belt system delivering to the 1,100-cu. yd. bins over the concrete batching equipment.

A surge pile of minus 6-in. crusher-run material is ahead of the washing plant, and an apron feeder and a vibrating grizzly are ahead of the primary jaw crusher. There is a high-capacity, heavy-duty electric vibrating feeder under the surge pile, four more augmented by hand operated gates under the large concrete sand pile, and an electric feeder and a hand gate beneath each aggregate pile.

The secondary crusher setup provides that all sizes of the coarser aggregates can be sent to one of the two crushing units and the crushed product may be recirculated. Crushed and natural gravel are not kept separate. The plant is of wood construction and consists of one screening tower in which are four sizing screens: two triple-deck 5 x 14-ft. screens that receive a split feed from the surge pile, and two double-deck 5 x 12-ft. final screens.

Controls for the batching plant and the aggregate plant are located high in the concrete batching tower and one man runs the entire operation. Batching equipment includes four 4-cu. yd. mixers.

Currently, there is a gradation problem with the sand, a matrix of fine, heavy black basaltic material and conventional silicate sand. It is difficult to get specific gradations from the usual settling devices since the smaller heavier grains settle at the same rate as the coarser light sand. The pit in use has clean free-flowing gravel, but it also has a very high percentage of #30-#50 fines, much of which must be wasted.

While there is a better deposit nearby with more coarse aggregate which could be blended with present material at the plant, it would require two digging units to produce it. The contractors feel that until excavation at the dam is further along and another unit can be released for aggregates, it is more economical to use the single 3⅝-cu. yd. shovel in one location. A fleet of fourteen 25-cu. yd. bottom dumpers is available to haul the aggregates a mile to the plant.

The finished concrete sand is a blended product that comes mostly from two dewatering spirals under the 28-ft. water scalping plant, with a few

Please turn to page 195



Ready to Blast?

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Meet Clarence Eddy—

plant superintendent extraordinary



Inventor-designer Eddy has solved some complex mechanical problems with a remarkable disdain for conventional solutions

By ROBERT LATIMER

IN HIS SIX YEARS as plant superintendent for Cinder Concrete Products Co., Clarence Eddy has almost singlehandedly lopped 25 percent off the cost of producing a cubic yard of lightweight aggregate, and has reduced plant production breakdowns by a whopping 85 percent.

The Denver, Colo., firm, managed by vice president R. A. Utiger, produces 450 cu. yd. of sintered clay and shale cake per day. That it turns out this yardage efficiently is directly due to Mr. Eddy, who has a flair not only for designing practical solutions for mechanical problems, but for carrying out the construction work himself.

One of the oldest and largest aggregate operations in the Rocky Mountain States, the plant currently turns out one third more aggregate with 40 electric motors than it did seven years ago with 76 motors and a brand new production assembly. Some 25 solenoids, often a fertile source of electrical and mechanical troubles, have been reduced to two. Expensive conveyor lines, thought indispensable in the original plant design, have also been eliminated.

The overall picture of how this inventive genius achieved his results is best shown by a series of specific examples in which superintendent Eddy ran head on into a problem and conquered it.

First, there was the matter of the bedding system. In the original design, bedding material was fed from a bin in the yard through 125 ft. of conveyor to a right-angle belt which transferred it to the feeder as the material was properly mixed for sintering. Not only was the bedding conveyor a

Please turn to page 150



This 240,000-pound steam drum, built by Combustion Engineering for a large generating plant, is here being hoisted 120 feet into position by strong wire rope. It's a striking example of how . . .

safety rides on quality wire rope

You may never hoist loads as large as this 120-ton drum. But *safe, top quality wire rope is just as important to your own operations.* For, although the price of a "bargain" rope would be less, failure of such a rope could cost you thousands of dollars in wrecked equipment. Don't be a victim of false economy. Buy a wire rope that's a quality rope—buy Wickwire Rope.

5339

WICKWIRE ROPE — A CF&I PRODUCT

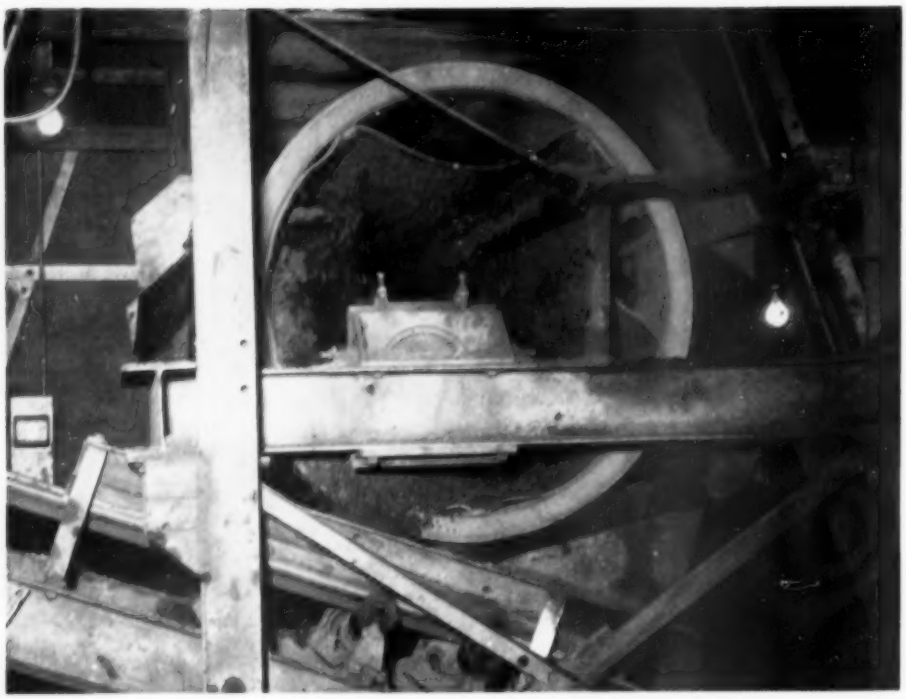
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THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Casper • Denver • El Paso Farmington (N. M.) • Fort Worth • Houston • Kansas City • Lincoln (Neb.) • Odessa (Tex.) • Oklahoma City • Phoenix • Pueblo Salt Lake City • Tulsa • Wichita • **PACIFIC COAST DIVISION**—Los Angeles • Oakland • Portland • San Francisco • San Leandro Seattle • Spokane • **WICKWIRE SPENCER STEEL DIVISION**—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) New Orleans • New York • Philadelphia

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Remodeled mixer. Note rubber lining which cleans the interior and eliminates shutdowns

Meet Clarence Eddy

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source of frequent repair problems, but it took up valuable space in the yard.

Mr. Eddy found that the primary necessity for the bedding material was simply the size of the mesh in the pie-shaped grates circulating through the sintering hearths, which had originally been cast with a $\frac{3}{8}$-in. mesh openings. He replaced them with $\frac{3}{16}$-in. openings and found that these worked ideally, preventing fall-through of completely unbedded sintering mix. This made it possible to not only eliminate the expense and handling of bedding material, but to do away with the supply conveyor, the feeder belt, controls and regulators, as well as four electric motors and four regulator units. The $\frac{3}{16}$-in. grates have proven exactly as reliable and proof against burning out as the $\frac{3}{8}$-in. mesh were.

Throughout all of his improvements, Mr. Eddy, an accomplished electrician, welder and tool designer, has concentrated on eliminating what he considers surplus electrical motors which contribute little through the overall production cycle. Typical was his decision to pick up the vacuum for the sintering hearth in the wind boxes already installed, obtaining 7 in. of vacuum suction in the process and eliminating five motors in the changeover, as well as providing a better flow of air and more even firing of the sintering mix.

An equally impressive feat was accomplished in connection with the mixer which mixes clay, shale, coke, coal and other materials from the feeder with water, preparatory to belt transfer into the sintering wheels. Purchased seven years ago, it was a standard model containing 88 tines distributed around its 10-ft. interior, to thoroughly mix the material through rotation.

The 1,100-lb. mixer put a tremendous strain on its drive shaft, which broke during the first week of operation and during the following year snapped as often as three times in a single week. Each repair job required at least nine hours, which meant a complete shutdown of the sintering plant and half the rest of the operation. Mr. Eddy decided the trouble lay in the high resistance the 88 tines created in moving through the mixing material, and in the combination of a short drive shaft, a reduction gear box and the use of only four pedestals to support the weight.

The problem of the mud mix building up on the mixer tines and wearing them out swiftly was solved by reducing the number of tines from 88 to 40, with a much wider space between them. This places far less strain on the drive shaft, and the resulting mix sinters equally well.

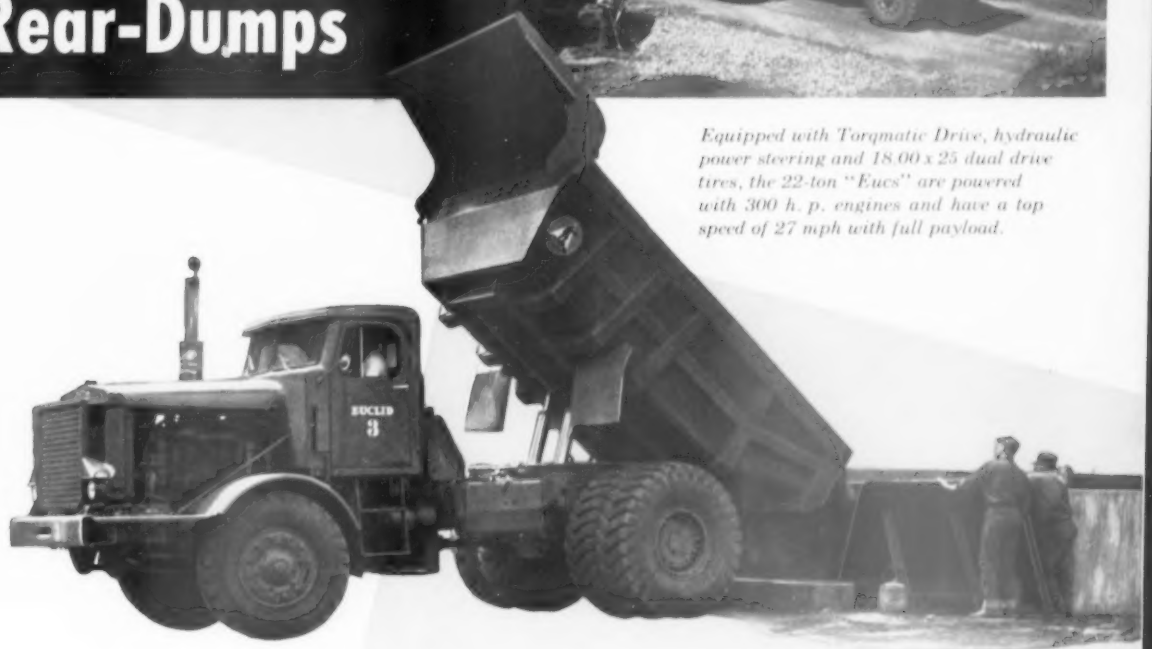
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87% Availability with "Euc" Rear-Dumps



Equipped with Torqmatic Drive, hydraulic power steering and 18.00 x 25 dual drive tires, the 22-ton "Eucs" are powered with 300 h. p. engines and have a top speed of 27 mph with full payload.



Five Euclids haul 2500 tons of rock daily for Dragon Cement Co.

Steady production is maintained at Dragon Cement Company in Northampton, Pennsylvania with a haulage fleet of six 22-ton Rear-Dump Euclids. Simple, rugged construction and a thorough preventive maintenance program have enabled these reliable haulers to post an 87% availability record. Depending on production requirements, four or five of the "Eucs" work an average of 6 hours per day each, with either one or two held for standby service.

Assistant Plant Manager F. J. Anderson reports that the Euclids are loaded by two 2½ yd. shovels and haul an average of 2500 tons of cement rock daily to the dumping spot over a mile away. Loads are dumped into the 35-ton hopper in 30-45 seconds. Total time for the 2¼ mile trip from loading shovel to hopper and return averages 11 minutes.

The dependable performance of "Eucs"—job-proved on hundreds of mine, quarry and industrial operations—results in more work done at lower cost per ton. Your nearby Euclid dealer will be glad to provide you with facts and figures on the complete line of Euclid earthmoving equipment . . . and show you why ***Euclids are your best investment.***

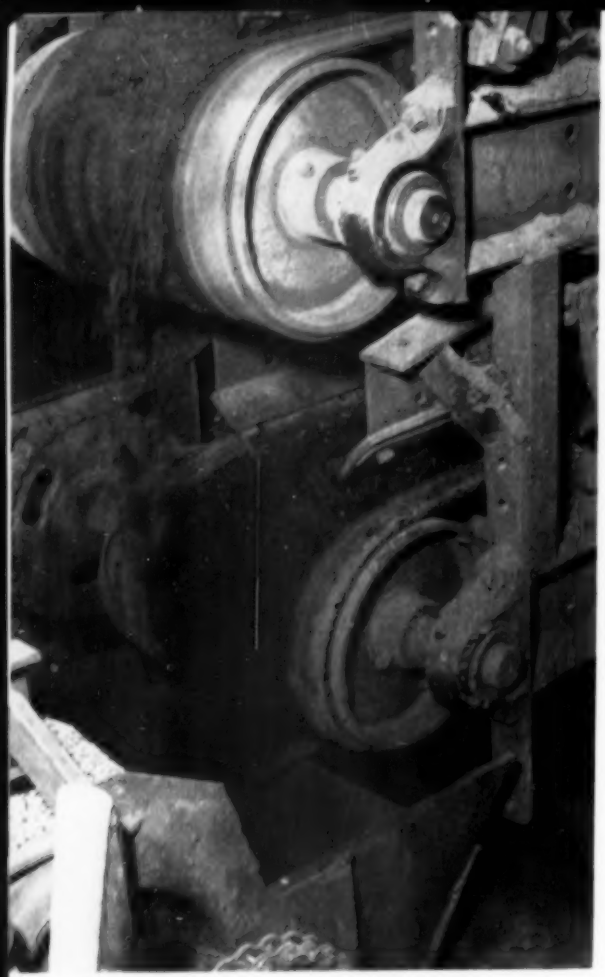
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EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE





Coal and coke mixing belts feeding mixer



Lateral conveyor belt built by the company

Meet Clarence Eddy

continued from page 150

Mr. Eddy also decided upon a rubber blanket lining for the circular mixers, which would convert them into self-cleaning units. This practice has since become widespread throughout lightweight aggregate plants. After some experimenting, Mr. Eddy obtained a special heavy-duty insulating rubber sheet, available in 4 x 10-ft. panels. He lined the interior of the mixer with four sheets, bolted at one end and at both sides, so that as the mixer turns and each sheet reaches the top, it bows down tube-fashion and shakes loose every granule of mix which ordinarily would adhere to the metal interior surface of the mixer.

To solve the shaft breakage problem, Mr. Eddy installed an extra pedestal and bearing on either side of the mixer, equally spaced between the original bearings. A standard size shaft, 5 ft. longer, was substituted and the gear box was eliminated altogether in favor of a geared motor automatically adjusting itself to the load. Since these changes were made, there have been no more shaft troubles in mixer operation.

During periods of heavy demand when it has been necessary to operate the Cinder Concrete Products plant two and even three shifts, the strap iron rail yard conveyors wore thin rapidly and eventually broke loose, with disastrous results when overloads on the conveyor piled up. To solve this problem he located, through a salvage dealer, a generous supply of 30 lb.-per-ft., tempered-steel railroad track, and welded these in place of the strap iron. The same rails, in use for more than five years to date, will apparently last indefinitely.

A sharp cut in conveyor costs came in connection with re-equipping the firm's several apron conveyors. As the plant was originally set up there were 630 expensive, machined steel wheels in these conveyors. Studying the loads to which the conveyors were subjected, Mr. Eddy scoffed at the necessity for machined wheels and tested, instead, molded steel wheels which cost less than half as much. Not only have the molded variety accepted the load responsibility without a single breakdown, but they have proven themselves less subject to mix, burrs and getting out of true.

Throwing out traditional practices where load-bearing surfaces are concerned has paid glittering dividends in the sintering hearth. Constant shutdowns were caused by the wearing out of hard-surfaced bearing shoes, 24 mounted on each of the sintering wheels to bear the weight of the firing mixture as it revolved around the circular hearth and discharged onto the apron conveyor. Mr. Eddy

Please turn to page 154

"324 tons per hour with 35% crush . . .

Wet and dry gravel crushed to 1" base material . . .

Maintenance costs estimated at 3/4¢ per ton . . .

Very little down time . . ."

Cedarapids Built by IOWA



No wonder Frank McLaughlin, President of F. J. McLaughlin Co., Marshall, Minn., is so well satisfied with his

CEDARAPIDS JUNIOR TANDEM

For some 14 years, Cedarapids Junior Tandems have always been hard plants to beat for high tonnage production. Newly re-designed last year, today's Junior Tandem adds a new kind of versatility to its profitable high capacity. With its bigger screen, and choice of jaw and roll crusher sizes which can be matched or mixed to give big primary capacity, big secondary capacity . . . or both . . . *the Junior Tandem is adaptable to the pit conditions you have to meet.*

Only a complete description of every Junior Tandem feature can show you how this plant will fit your profit picture. Ask your nearest Cedarapids distributor for details and production figures.

Apply these NEW JUNIOR TANDEM FEATURES to your job!

YOUR CHOICE OF CRUSHER SIZES

10" x 36" jaw crusher gives extra primary capacity when crushing percentages are high. 10" x 24" jaw crusher meets average conditions. 30" x 18" roll crusher assures production of high percentages of fine-crushed product. 24" x 16" roll crusher meets normal secondary crushing requirements.

BIGGER SCREEN

Width of the Horizontal Vibrating Screen has been increased 6" and a half deck has been added. The 42" x 10', 2½-deck screen produces from one to three products simultaneously, from 2" road ballast down to minus ¼".

"BIG PLANT" FEATURES AT SMALLER PLANT COST

Junior Tandems now available with sand ejector screw and washing spray bars (optional); monotype elevating wheel; delivery conveyor backstop; belt wipers; self-cleaning pulleys; new type adjustable eccentric on reciprocating feeder; larger hopper; separate clutch control on screen.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.

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Mr. and Mrs. Eddy. Photo shows how sulphuric acid ate through the original iron of the wind box. Gleaming metal showing through is stainless steel liner

Meet Clarence Eddy

continued from page 152

hit on the idea of substituting rollers for the shoes. Because the superintendent was loath to use expensive machined rollers for the job, he experimented with a cast wheel with roller bearings. Many well-wishers informed Mr. Eddy that a ball bearing would not stand high temperatures for more than a few hours of operation in the sintering machines. Testing ball bearing races himself, Mr. Eddy proved that there was no expansion problem up to 400 deg. and by Kelvin temperature tests at the hearth itself, he found that there was little likelihood that any of the rollers would contend with heats above that level.

He drilled out several test wheels, all counterbored with retaining strips and inserted two ball-bearing races, expanded with heat, and forced into place with a heavy vise. He made the bushings for between the axle and the roller bearing from elderly boiler tubes, honed down to a smooth finish. This operation was carried out two years ago, and since that time the roller-bearing load-bearing wheels have provided perfect service, making possible smoother, less noisy operation of the sintering grates.

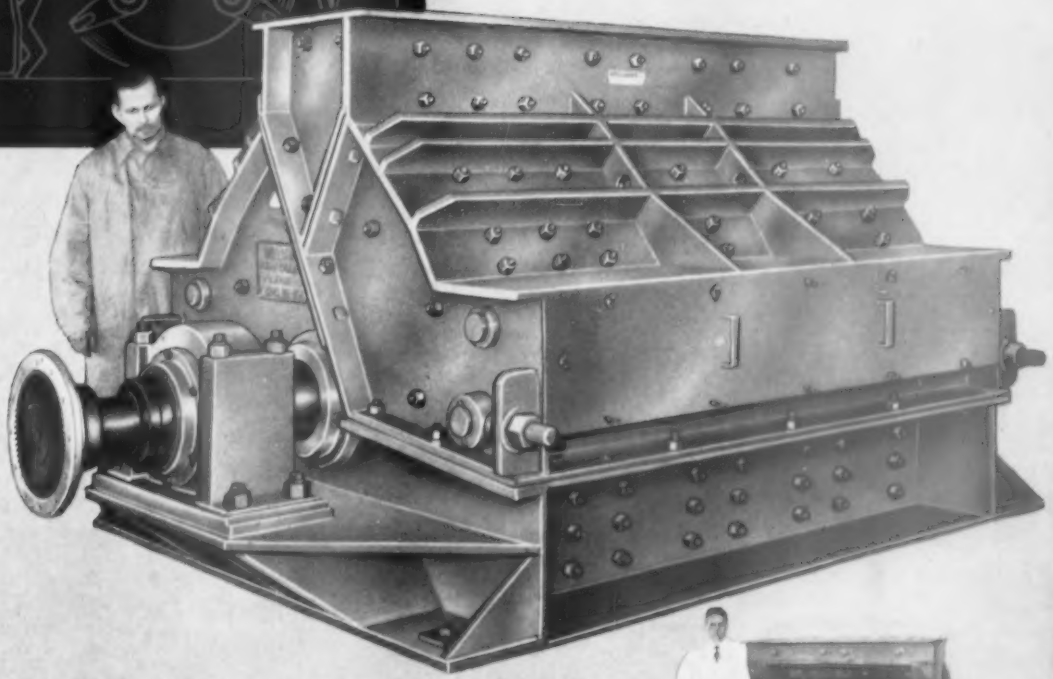
Not all of superintendent Eddy's improvements have been in the field of machinery innovations. Another excellent example of his ingenuity came with the introduction of coke instead of straight breeze coal firing in sinter cake production. The decision to experiment with something other than straight breeze was prompted by the city's complaint about the large amounts of coal smoke being produced by the sintering plant. However, the firm had already decided to test firing with coke, which it was felt, would produce a swifter, more even firing job.The crusher, formerly used for coal only, would not handle coke with its 2 in. wide grates. But, Mr. Eddy immediately produced a solution with more rugged grates, cut from block steel with a smaller grate size, which cut the coke crushing problem down to a minimum.

Since the ignition point on coke was well above the level of breeze coal, it was nearly impossible to fire with coke alone. So the plant superintendent tested various proportions and found that adding five percent crushed coke and five percent breeze coal to the sintering mix gave them lower smoke output, quicker ignition and maintenance of a smooth even heat level, and resulted in far more even sinter cake and a minimum amount of returns. Coal and coke are now fed by rubber-belt conveyors, powered by variable-speed electric motors which cut the percentages to an exact point in providing coal and coke in the mix. All of Cinder Concrete Products Co.'s lightweight aggregate has been fired with this mix ever since.

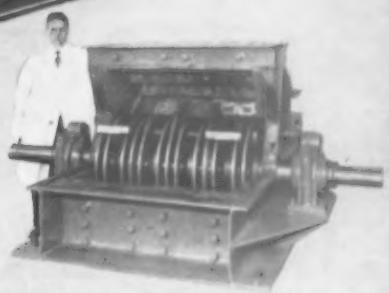
Shortly after the aggregate plant was built, the company was unpleasantly surprised to find that an unusually high percentage of sulphuric acid

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WILLIAMS REVERSIBLE IMPACTOR



- 100% Impact Reduction
- No Friction Or Abrasion
- Unobstructed Discharge
- Less Upkeep Expense

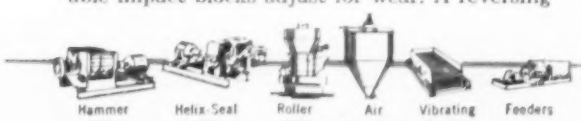


Internal view showing manganese steel impact blocks, hammers and liners. Rugged, heavy steel plate construction. Extra large shafts are mounted in oversize bearings sealed in self-aligning housings.

Unequalled For Secondary Grinding

Reduces limestone and material of similar hardness to $1\frac{1}{2}$", $\frac{3}{4}$" or smaller. Properly adjusted, the Williams Impactor makes excellent material with the proper percentage of fines for road base course. Unusually low upkeep expense as reduction is 100% by impact. Material is fed to enter between the hammers and is thrown against the impact blocks setting up a repeated ricochet action which accomplishes the reduction. Adjustable impact blocks adjust for wear. A reversing switch on motor permits rotating hammers in either direction, to the left today and to the right tomorrow, thereby giving double hammer life. No grates are used. Entire bottom is open permitting unobstructed discharge of crushed material and less wear and tear. A size for every job. Let us tell you about one for your use.

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JALLOY special alloy steel

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Heat treated Jalloy steels wear as much as 20 times longer than mild steels under rigorous impact and abrasive conditions. By using Jalloy you can cut maintenance cost drastically. Increased product life reduces downtime and lowers your labor costs.

Jalloy steels are available in the forms you require (plates, hot rolled sheets, hot rolled bars, small shapes and structurals). Jalloy can be purchased in three grades to meet specific use requirements: Grade 1, where formability is important; Grade 3, capable of being heat treated to excellent physical properties for good resistance to abrasion or wear; Grade 7, for high hardness with good ductility or wear resistance.

Your local distributor can supply you with latest information on these Jalloy grades, or you can write to Jones & Laughlin, Dept. 481, 3 Gateway Center, Pittsburgh 30, Pa.

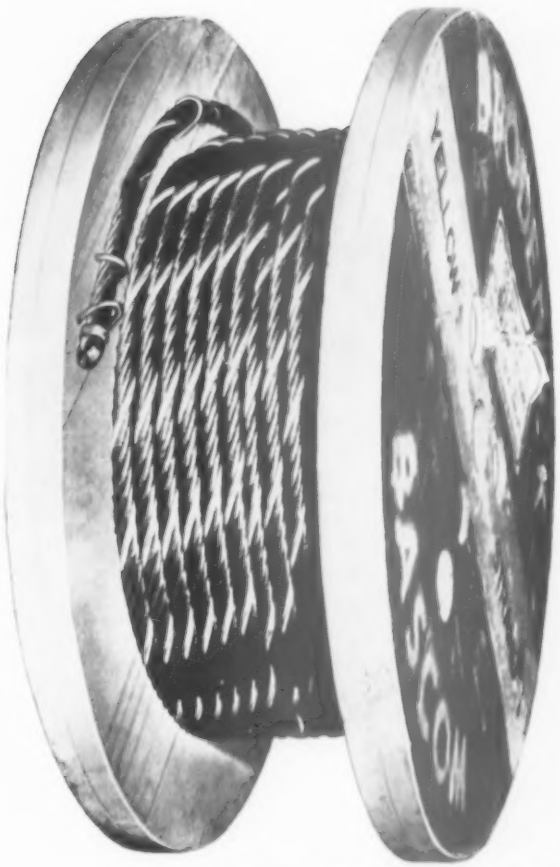
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STEEL . . . a great name in steel

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Wire rope maintenance

Take care of that cable

By J. B. SINCLAIR*



To prevent fraying, weld end of cable as shown

WIRE ROPE IS AN EXPENDABLE item which must be replaced frequently during the life of the machine which uses it. Many dollars can be saved each year by giving the cable proper care and maintenance.

Individual steel wires are preformed into a long spiral, twisted together into strands and the strands twisted into a rope. This method of construction permits great flexibility without excessive "stretchiness" and minimizes friction between wires as the cable bends around sheaves and then straightens under tension.

In operation, a wire rope cable is a group of closely fitted moving parts, and like other parts of a machine, requires reasonable care. Its service life can be shortened by abuse or lengthened by proper use and maintenance.

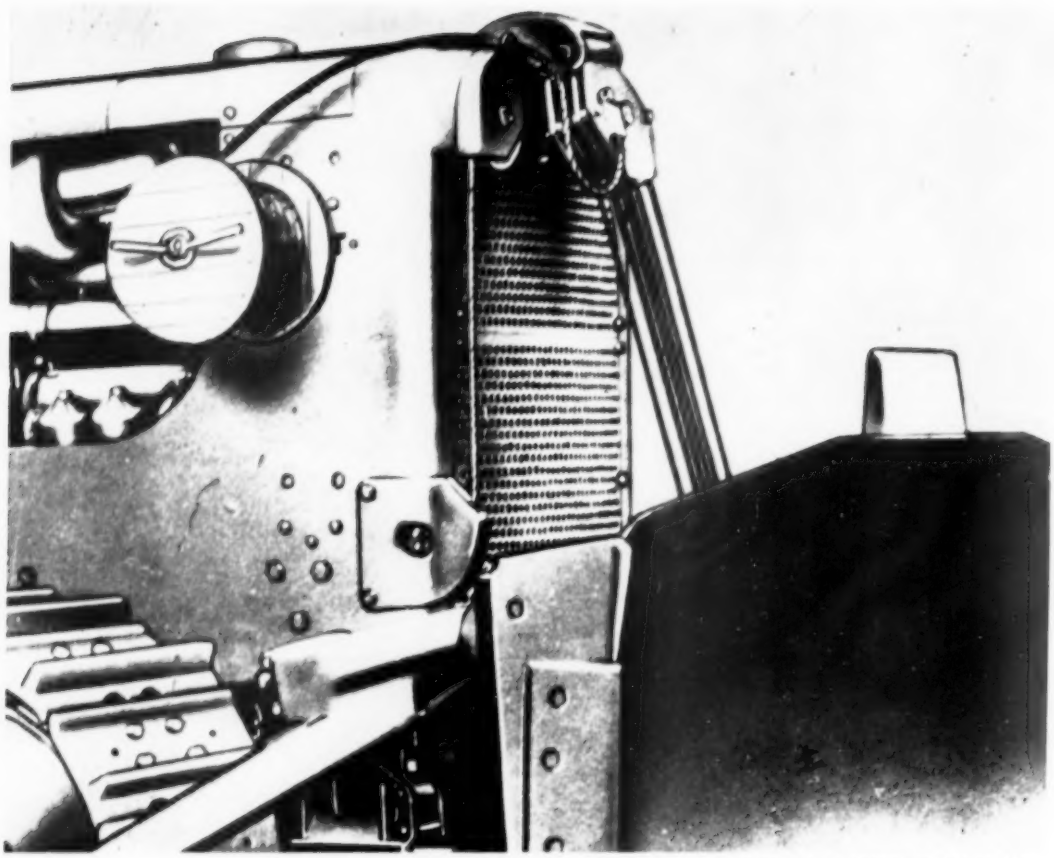
It's not at all uncommon to see a reel of cable rolled over an obstacle with the outside layers of wire rope taking the brunt of the shock, or to see a pry bar being used to move a reel of cable. Whenever this occurs, some of the life is taken out of the rope before it's ever put to use.

Sharp bends or kinks in a cable are very frequently the cause of rapid wear. When bent or kinked, the wires and strands are moved out of their relative positions and unequal tensions are created on individual wires under load. Kinks are caused by careless handling of the cable. Always pull the cable straight away from a rotating reel and do not let the reel rotate faster than the cable is being removed; otherwise the danger of kinking is increased. When wire rope is removed from a reel which does not rotate, uncoil the length of rope required, placing one coil on top of the other. The cable can then be easily moved to the job site and installed without kinking. When installing new cable, assemble the cable on the drum in the direction of the natural coils. If installed correctly, the cable will reel onto the drum in a smooth layer.

Here are some other important facts to remember when installing new cable. Always be sure to use the correct cable size. Weld or splice the end of the strands of cable together. In this way, the strands are held in their relative positions. Cable wear will be less because strands have not moved out of their relative position. The strands of the cut-off end of the reel should be bound and the end of the cable secured to the reel. Never drive nails through the cable to secure it to the reel, as wires can be damaged or broken and the cable weakened.

Please turn to following page

*Service Department, Caterpillar Tractor Co.



A small, spare reel of cable, mounted as shown, makes replacement of worn cable easy

Cable maintenance

continued . . .

Proper lubrication of wire rope will extend rope life, promote safety and reduce downtime. The frequency of cable lubrication depends largely on operating conditions. If operating in dusty conditions, the cable should be lubricated sparingly, if at all, since dust will adhere to the lubricant and cause wear on both cable and sheaves. Cable lubrication is recommended in areas where atmospheric conditions support rusting and corrosion, and a film of lubricant will definitely extend cable life.

To prevent rusting, cable lubricants should be water resistant, contain no acids or alkalies and have a high surface tension. Each time a cable is flexed, the wires in each strand and the strands which make up the cable must slide over each other. For this reason, a penetrating, clinging lubricant of high melting point such as "crater compounds"—used for open gears and for wire rope on earthmoving equipment—should be used. At the time of an extended or seasonal shutdown, the cable should be inspected, cleaned and lubricated. Sheaves and rollers should always be kept clean and free turning to minimize sliding wear on the cables.

Properly maintained equipment means extended life for all parts. Inspections of operating parts and the replacement of worn or broken parts is great economy.

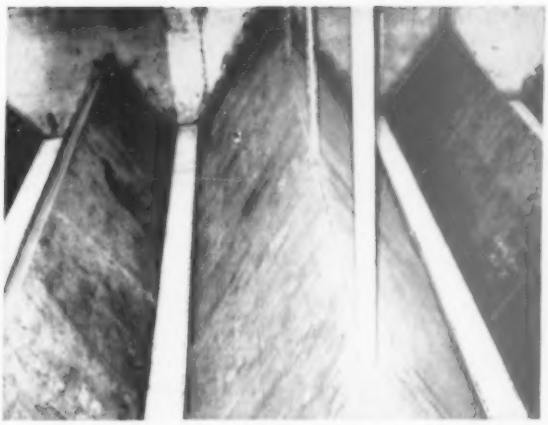
The careful maintenance of cable-operated equipment determines the life of a wire rope. Misaligned sheaves, bad sheave grooves and "frozen" sheaves reduce cable life by causing burning and fraying. Excessive friction between the rope and other parts of the machine usually results in burning, and burned steel becomes brittle and cracks. Cracked wires soon lead to frayed strands making a weak spot that is an operating hazard.

The useful life of cable is reduced by operating over sheaves that shimmy. Shimmy is caused by

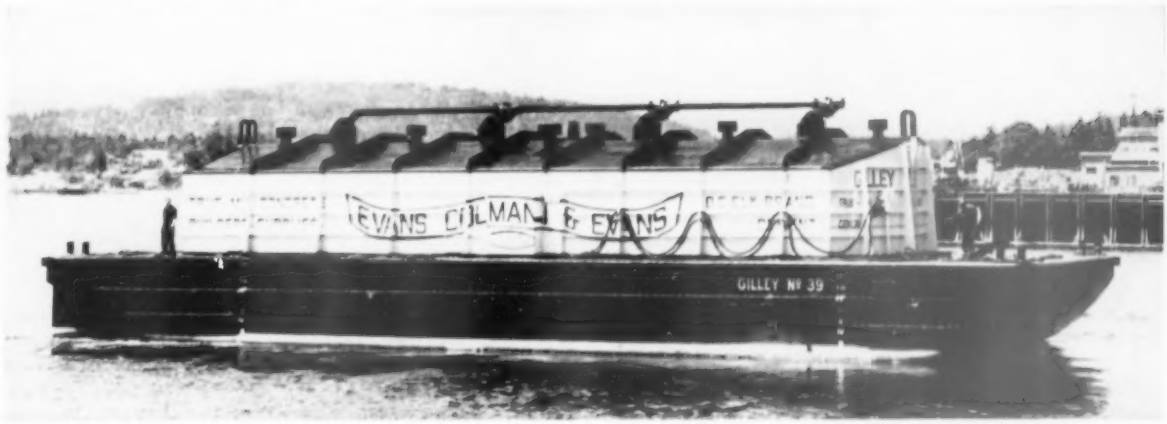
Please turn to page 198



Fuller-Kinyon Pump which conveys cement from barge to storage on shore.



Looking down into V-bottom hoppers, shows open type Airslides.



FULLER DEVELOPS FIRST ALL-PNEUMATIC, SELF-UNLOADING BULK-CEMENT BARGE

Always looking for faster, more efficient means of handling bulk Portland cement, Fuller engineers developed and designed the first all-pneumatic, self-unloading barge now in the service of Gilley Bros. Limited of New Westminster, B. C.

The barge is completely self-contained, with all unloading equipment and accessories on board. The hold comprises eight V-bottom hoppers, each equipped with open type F-H Airslide® fluidizing conveyors. Enclosed type Airslides convey from the hoppers to a Fuller-Kinyon stationary pump located underneath the hoppers, the pump conveying the cargo to storage on shore.

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Initial unloading of the Gilley Bros. barge with a cargo of 4300 barrels was very successful, complete discharge taking not over 8½ hours. This performance has resulted in the purchase of a second barge of 5000 barrels capacity.

Here is but one example of how Fuller ingenuity and equipment are being put to work to help you cut costs and increase production. When you have a problem of conveying dry bulk materials, Fuller engineers will gladly make a study of your conditions and submit suggestions . . . without any obligation on your part.

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By ERNEST W. FAIR

Need a loan?

Bankers outline quickest way for small producer to borrow money

"HOW CAN A SMALL producer arrange bank loans more quickly?"

We asked this question of a group of bankers and got some straight answers. These experts agreed that there are certain definite ways to speed up an OK on your loan.

Chief among them is to have a loan application prepared in advance, ready to present when you make your first call on the bank. Bankers deal in facts and figures. They need yours to make a loan decision. It's wise to assume that they are unfamiliar with your field and your company. Tell them all they need to know to understand your operation, judge your needs and your ability to repay. Listed below are the major points to be covered when preparing your application:

What's your record? A complete picture of your company's financial history is the important part of your story. Bankers use the past as a guide to the future. Include profit-and-loss statements and balance sheets covering the past five years. Be complete. Show business volume broken down by products. Itemize all costs of running the business; your books and tax records will give you the figures. If you need a form to follow, refer to annual reports from large industrial companies. Say enough. Omitted facts may arouse suspicion.

How good is management? How well could your management run your business should there be a recession during the life of the loan? Bankers must consider this matter coldly and without emotion. Good management is your biggest asset. Talk about the men who run your company—their character, integrity, business experience, community position, credit, assets and even health.

Where do you stand? The total volume of rock products business done locally compared with the percent done by your company gives your banker an idea of where you stand. Fill in the details by including a short paragraph describing your competitors' methods, physical layout and finances compared with yours.

What's your future? Your banker will want to know the growth potential in your field. Give him a brief analysis of future supply and demand. Then show him how you expect to handle it—your sales and marketing plans.

Why do you need a loan? This basic question is often poorly answered. It demands a dollars-and-cents reply. A detailed outline of the uses to which the loan will be put should appear on your application. The words "future expansion" mean nothing to a factual banker. He wants to know how and why.

How will you repay? This is the last and most

Please turn to page 200



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LIMA dragline speeds dredging operation in Florida



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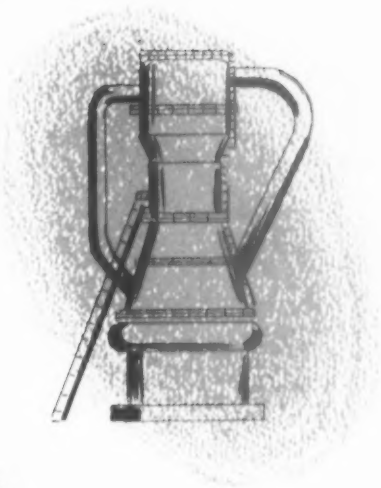
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Part 3 of a series



From blast furnace slag to cement

The greater the CaO content of the slag, the better the hardening of the concrete surface

By TARO TANAKA*
in collaboration with
Toru Sakai and Jun Yamane

IT IS WELL KNOWN that the surface of slag-sulfate cement mortar or concrete does not harden sufficiently during the early atmospheric curing and that the hardened surface becomes fragile with age. The main cause of this phenomenon, called "sand-off" or "Absanden," has been ascertained as the action of CO_2 in the atmosphere. [9,10] We have studied this problem and have revealed[11] that this phenomenon is related closely to the chemical composition of the slag used, especially to the amounts of the three principal components, CaO, Al_2O_3 and SiO_2. This relationship was followed by our experiments, using the 34 synthetic glassy slags in Part I. The surface fragility of the slag-sulfate cements was treated in the study of their hardenability.

In these experiments the surface hardening of the cement mortar was observed to become better with an increase in CaO content or with a decrease in Al_2O_3 content of the slags used in the cement. The effect of the latter is somewhat more significant. We also determined that the development of the hardenability and the improvement of the surface fragility by changing the chemical composition of the slags were independent of each other.

When the content of portland cement clinker of the cements were increased to four or to six percent, the surface fragility was observed to be improved. The effect of the increase in the clinker content was estimated to vary with the chemical compositions of the slags in the cements.

Finally, the most desirable chemical compositions of the slags, for the slag-sulfate cements (considering their hardenability and surface fragility) may be predicted to exist in the range of 31 to 33 percent SiO_2, 18 to 19 percent Al_2O_3 and 49 to 50 percent CaO, when assuming the sum of the percentages of the three main components SiO_2, Al_2O_3 and CaO to be equal to 100 percent.

"Sand-off" is concerned with the fragile part of

Please turn to following page

*Taro Tanaka is a Doctor of Engineering, and is Director in Charge of Research, Onoda Cement Co., Ltd., Onoda, Japan. This is Part III of the article which appeared in the March and April, 1957 issues of ROCK PRODUCTS.

TABLE 1 The chemical composition and glass content of the 34 synthetic glassy slags

No.	Slag Sample	Calculated Composition percent			Chemical Analysis percent			Glass Content percent	
		SiO_2	Al_2O_3	CaO	SiO_2	Al_2O_3	CaO	Under Crossed Nicols	By Bromoform Method
1	A_1	34	14	52	34.0	13.9	52.1	96	97
2	A_2	32	16		31.9	16.1	52.0	96	98
3	A_3	30	18		30.1	18.2	51.7	94	96
4	B_1	36	14	50	35.7	14.3	50.0	100	100
5	B_2	34	16		33.7	16.2	50.1	98	99
6	B_3	32	18		31.7	18.1	50.2	98	99
7	B_4	30	20		30.3	19.8	49.9	98	100
8	B_5	28	22		28.1	22.0	49.9	98	99
9	B_6	26	24		26.0	23.8	50.2	100	100
10	C_1	38	14	48	38.1	14.0	47.9	99	99
11	C_2	36	16		36.2	15.9	47.9	99	100
12	C_3	34	18		33.9	18.0	48.1	100	100
13	C_4	32	20		32.0	20.3	47.7	99	100
14	C_5	30	22		30.0	22.0	48.0	100	99
15	C_6	28	24		27.7	24.2	48.1	98	99
16	C_7	26	26		26.2	25.9	47.9	98	100
17	D_1	40	14	46	40.2	13.9	45.9	99	100
18	D_2	38	16		37.9	16.1	46.0	98	99
19	D_3	36	18		36.1	17.9	46.0	98	98
20	D_4	34	20		33.7	20.2	46.1	99	100
21	D_5	32	22		31.9	22.1	46.0	98	99
22	D_6	30	24		29.9	23.9	46.2	99	99
23	D_7	28	26		27.7	26.2	46.1	99	99
24	D_8	26	28		26.2	28.0	45.8	99	100
25	E_1	40	16	44	39.8	16.2	44.0	98	100
26	E_2	38	18		37.7	18.2	44.1	100	100
27	E_3	36	20		35.9	20.1	44.0	99	99
28	E_4	34	22		33.8	22.3	43.9	99	100
29	E_5	32	24		31.9	23.9	44.2	99	100
30	E_6	30	26		29.7	26.3	44.0	98	99
31	E_7	28	28		27.7	28.2	44.1	99	100
32	E_8	26	36		25.7	30.3	44.0	98	99
33	F_1	40	20	40	39.6	20.3	40.1	100	100
34	F_2	36	24		35.7	24.1	40.2	100	100

From blast furnace slag

continued from preceding page

the surface which can be rubbed off easily by hand as F. Keil[7] reported at the Third Symposium of Cement Chemistry in London in 1952. The measurement of the degree of surface deterioration can be carried out by determining the quantity of surface rubbed off with the thumbs. It is also desirable to measure the depth of the fragile layer, and thus we applied this method to our experiment:

A pointed drill-shaped rod of hard steel (Fig. 4) was set on the surface of specimens and pressed into their fragile layer, under constant load. The depth of this layer was obtained directly by measuring the distance that the rod moved down, and

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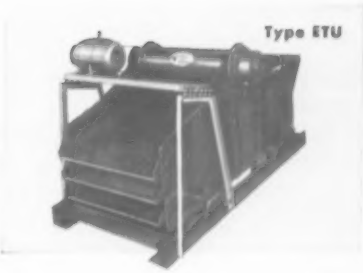


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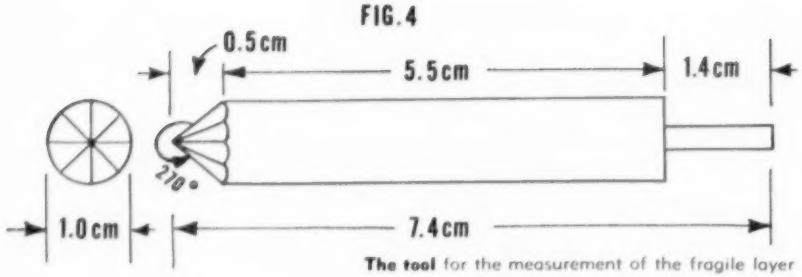
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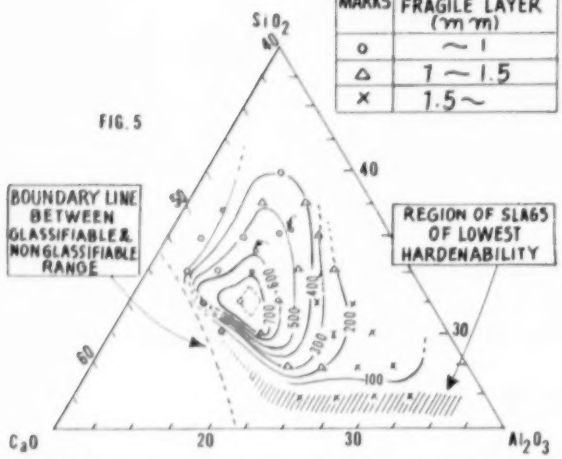
FIG. 4



The tool for the measurement of the fragile layer

FIG. 5

MARKS	THICKNESS OF THE FRAGILE LAYER (mm)
o	~ 1
△	1 ~ 1.5
×	1.5 ~



Relation of the compressive strength and the surface fragility of the slag-sulfate cements to the chemical composition of the slag used

From blast furnace slag

continued from page 164

the error of the measurement was estimated to be ± 1 mm.

Each of the slag-sulfate cements in Table 1 was molded into a 1 x 1 x 7-cm. test bar as a 1:2 mortar using Toyoura standard sand at water-cement ratio of .55. The mortar was smoothed off with a trowel immediately after molding, and kept in a moist closet for 24 hours at the temperature of 20 deg. C. The test specimens were then removed from the molds and stored in the same moist closet for six more days. The measurement of the surface fragility was then performed on each of the specimens at the age of seven days after molding.

For the cements with two percent portland cement clinker, the correlation of the surface fragility of the test specimens with the chemical compositions of the slags and with their hardenability is shown in Fig. 5.

The surface fragility of the specimens is grouped into three classes depending on the thickness of the fragile layer exposed to the atmosphere. The three symbols in Fig. 5, circle, triangle and cross, represent the thickness of the layer: less than 1 mm., 1.1 to 1.5 mm. and, finally, more than 1.6 mm. respectively.

From Fig. 5 we find that the surface hardens almost perfectly when the chemical compositions of the slags used in cement are in the range of 48 to 52 percent CaO and 14 to 18 percent Al_2O_3. The degree of surface hardening becomes worse as CaO decreases or Al_2O_3 increases.

When the content of Al_2O_3 is constant the degree of surface fragility of the specimens then depends only on the percentage of CaO in the slags. The greater the CaO content, the better the hardening of the surface.

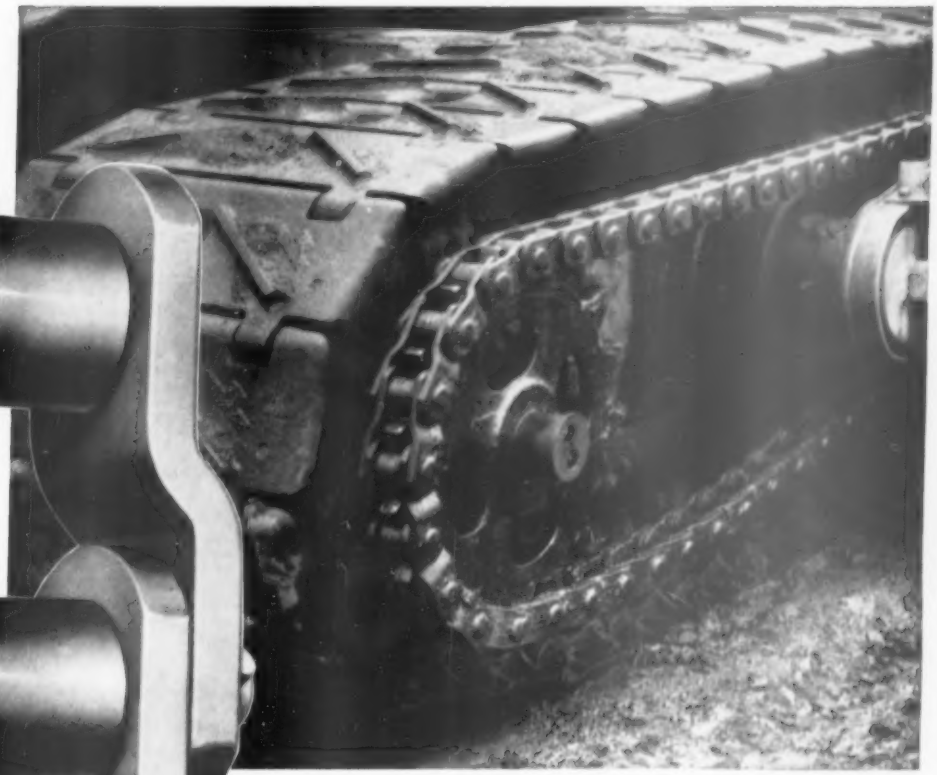
Also, when the percentage of CaO is constant the surface fragility changes generally in accordance with the percentage of Al_2O_3 in the slags, and the surface condition apparently becomes better with a reduction in Al_2O_3 content. It is noticeable that the difference in surface fragility in the former case is somewhat larger than in the latter. Considering the hardenability together with the surface fragility, the specimens excellent in surface hardening are not always superior in the property of hardenability.

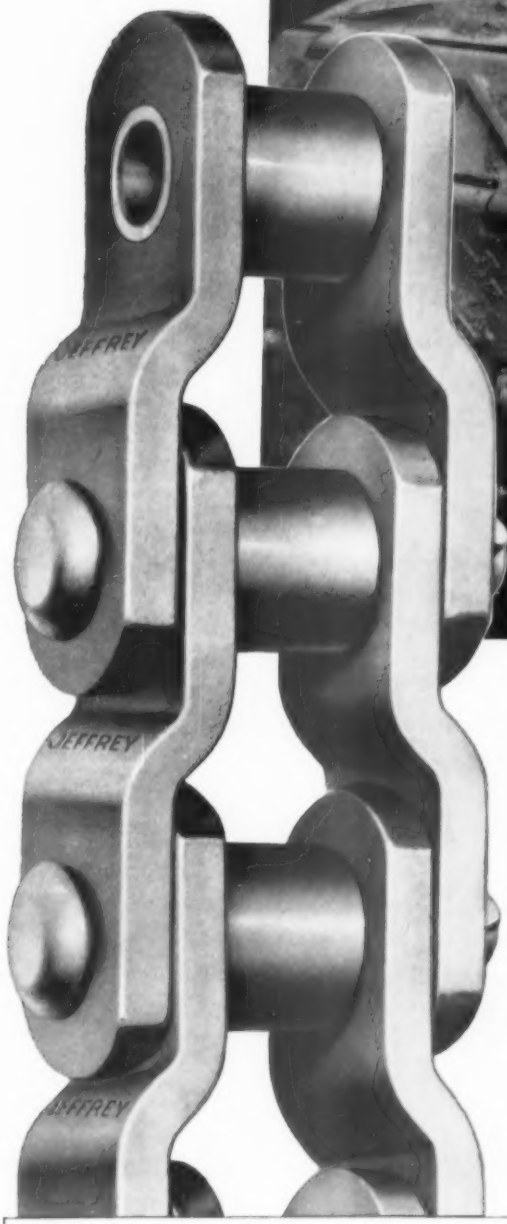
For instance, the specimens containing the slag A_1 whose chemical composition is highest in CaO and lowest in Al_2O_3, were particularly excellent in surface hardening, but the compressive strengths were rather low. Thus the trend exists in the region of CaO 48 to 52 percent, Al_2O_3 14 to 18 percent, as in Fig. 5, that the compressive strength becomes higher with the increasing amount of Al_2O_3 in the slags. The variations in both compressive strength and the surface fragility caused by the difference of the chemical compositions of the slags therefore are independent of each other.

The test was also made on the same cements prepared from the granulated blast furnace slags used in the strength test. Here the thickness of the fragile layer was observed as less than 1 mm. It was thus confirmed that the result of the tests

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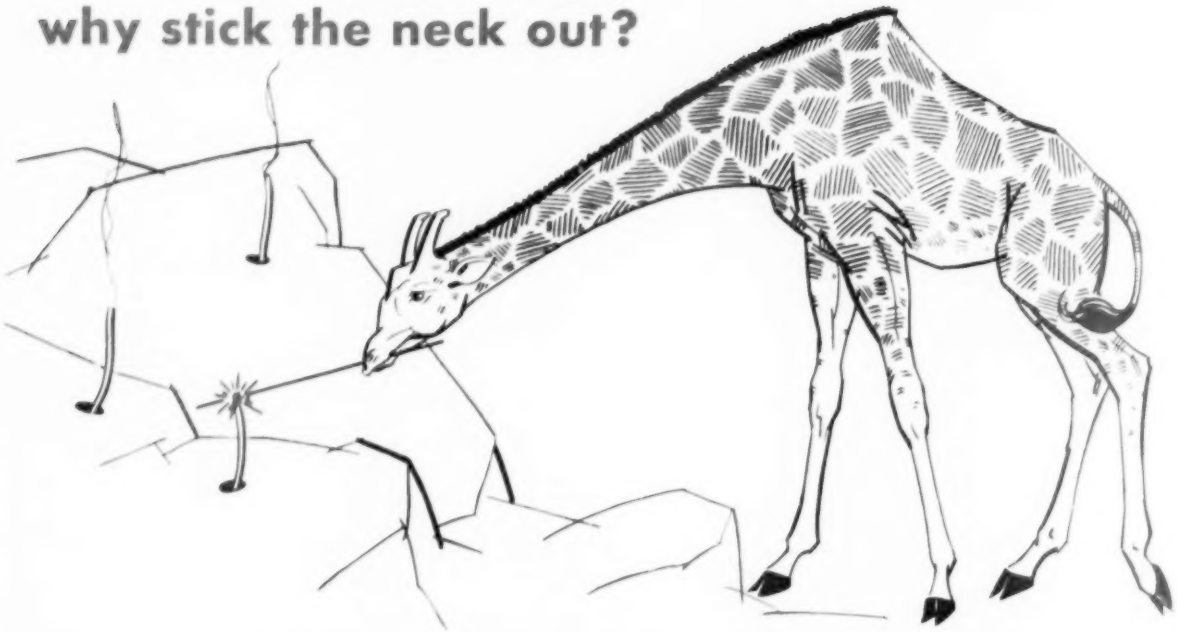
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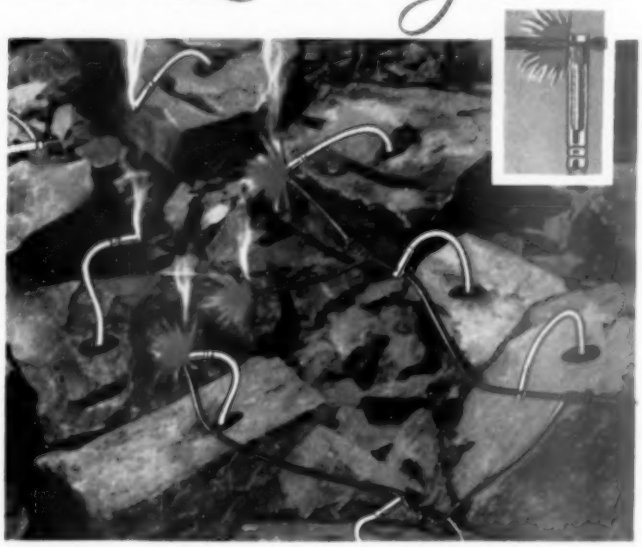
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DRILLING—Mobile Drilling, Inc. has combined all its descriptive literature in a handy catalog-packet covering the company's earth drilling accessories and rotary drilling rigs.

Enter 709 on Reader Card

DRIVES—The Falk Corp. is distributing a brochure describing its complete line of double reduction shaft mounted drives. The three classes of drives covered by selection tables are: Class I, ½ to 40 hp; Class II, ½ to 25 hp; Class III, ½ to 20 hp. Other bulletins are: 7101, load classifications and dimensions; 7102 and supplement, sheave and belt selections.

Enter 710 on Reader Card

DUST COLLECTOR—American Air Filter Co., Inc. has released Bulletin 274B describing the Type W Roto-Clone dynamic precipitator. The operation and various arrangements of the dust collector are discussed.

Enter 711 on Reader Card

ELECTRIC MOTORS — Sterling Electric Motors, Inc. has announced publication of a 12-page brochure describing its complete line of standard electric motors. Several electric motor applications are illustrated and selection information is included.

Enter 712 on Reader Card

FRONT-END LOADERS—Sherman Products, Inc. has prepared a bulletin describing its front-end loader and various attachments for use on Fordson major tractors. Specifications of the loader are included and its various applications are described.

Enter 713 on Reader Card

GRAPPLE—Joy Mfg. Co. has made available Bulletin 4-27 on the Joy JPG-200 pneumatic grapple. Details are given on operation and application of the grapple, which is adaptable to most types of shafts. Complete specifications are given in the bulletin.

Enter 714 on Reader Card

GRATING AND TREADS—Blaw-Knox Co. has published Bulletin No. 2527 on grating and treads. The bulletin describes electroforged, riveted, rectangular, diagonal, "U" type and "T" interlocked grating and treads. Tables on safe loads and specifications are included.

Enter 715 on Reader Card

HOSE FITTINGS—Le-Hi Div., Hose Accessories Co. has issued eight-page Bulletin 140 describing brass hose fittings for low and medium pressure service in conveying air, spray, steam, suction, water and for gas welding.

Enter 716 on Reader Card

INDUSTRIAL BURNERS—Coen Co. has issued a 12-page catalog on its Fyr-Compak industrial burners for gas, oil or combination firing. Views of plant installations are included.

Enter 717 on Reader Card

USE THIS READER SERVICE CARD for additional information on:

ADVERTISED PRODUCTS • LITERATURE • NEW PRODUCTS • CATALOGS

READER-SERVICE CARD

RP-10-57

ROCK PRODUCTS
79 W. Monroe St.

OCTOBER, 1957
Chicago 3, Illinois

Cannot be serviced after December 1, 1957 postmark.

Please print or type

Name _____ Position _____

Company (In Full) _____

Company Address _____ City _____ Zone _____ State _____

MAIN PRODUCT OF PLANT _____ CAPACITY _____

[THIS INFORMATION WILL HELP US GIVE YOU ALL MORE SERVICE.]

Send information on items identified by key numbers beside or below items of interest to you. List your choice in numerical order. Limit 10 per card.

(1) ..... (2) ..... (3) ..... (4) ..... (5) .....

(6) ..... (7) ..... (8) ..... (9) ..... (10) .....

IF NO KEY NUMBER, USE COMPANY NAME

BUSINESS REPLY CARD
No Postage Stamp Necessary If Mailed in the United States

FIRST CLASS
PERMIT NO. 1417
CHICAGO, ILL.

— POSTAGE WILL BE PAID BY —

ROCK PRODUCTS
79 WEST MONROE ST.
CHICAGO 3, ILL.

READER-SERVICE CARD

TO HELP YOU OVERCOME TODAY'S PROBLEMS . . .
. . . AND TO PLAN EFFICIENTLY FOR TOMORROW

FREE INFORMATION

You can obtain catalogs and literature listed on these and other pages of the magazine by entering the number appearing either below or beside the item of interest on the READER-SERVICE CARD in this page.

INDUSTRIAL TIRES—B. F. Goodrich Tire Co. has brought out a 36-page illustrated guide book that explains all phases of industrial tire use. The booklet includes specifications of all types of industrial tires, the uses of each type, the variations in pneumatic tire capacities at various speeds and information on how to change steel wheels to rubber-tired wheels.

Enter 718 on Reader Card

KILN TEMPERATURE CONTROLS — Leeds & Northrup Co. has made available four-page data sheet 705 (2) containing complete information about its equipment for firing temperature measurement and control for rotary kilns. Included are photographs and diagrams illustrating details of the system and its installation, and ordering instructions and specifications.

Enter 719 on Reader Card

MOTOR SCRAPER—Allis-Chalmers Mfg. Co. is featuring performance and design features of its TS-160 motor scraper in eight-page Catalog MS-1226. Photographs, illustrations and specifications describe the model's design and construction story.

Enter 720 on Reader Card

OILLESS BEARINGS—Arguto Oilless Bearing Co. is distributing Catalog 240 covering its line of self-lubricating oilless bearings for roller conveyors and screw conveyors. Engineering information covering installation procedures, operating conditions, tables to determine speed and load values, tolerances, clearances and press fits are included.

Enter 721 on Reader Card

PORTABLE CRUSHING PLANTS—Lippmann Engineering Works, Inc. has made available a brochure on the "Mohawk", a new portable primary crushing plant, having a range of four sizes. Details and specifications are included in the bulletin.

Enter 722 on Reader Card

PUMPING UNITS—Sprague & Henwood Inc. has issued Bulletin 370 illustrating and describing its pumping units for core drilling. Specifications for the pumps are included.

Enter 723 on Reader Card

ROCK BITS—Hoffman Bros. Drilling Co. is distributing a general catalog covering its complete line of drill bits, listing sizes, setting charges, weights and uses. Up-to-date price sheets are included.

Enter 724 on Reader Card

ROLLER BEARINGS—Dodge Mfg. Corp. has published eight-page Bulletin A668 describing its Spher-Align pillow block. The bulletin contains tabulated data on dimensions, shaft sizes, weights and radial load ratings including photographs and engineering drawings.

Enter 725 on Reader Card

SAFETY GARMENTS—Fyrepel Products, Inc. is distributing an eight-page catalog describing its complete line of entry suits, proximity suits, hoods, sleeves, mitts and gloves, coats, pants, aprons and heat reflective curtains. Testing procedures are indicated by comparison charts.

Enter 726 on Reader Card

SEMI-DUMP TRAILER — Cook Bros. Equipment Co. has recently published an eight-page catalog describing its "Stabilift" semi-dump trailer.

Enter 727 on Reader Card

SHOVEL CATALOG—Bay City Shovels, Inc. has made available a 20-page catalog featuring its heavy duty, 1 yd., 25-ton capacity crawler crane, which can be used as a shovel, hoe, crane, clamshell or dragline.

Enter 728 on Reader Card

TORQUE CONVERTERS—The National Supply Co. is presenting four-page data sheet 101 describing its torque converters for excavators, cranes and shovels. Representative types and makes of engines with which the 17 sizes of converters can be used in the 100 to 1,000-hp. range are listed.

Enter 729 on Reader Card

TRACTOR SERVICE—Caterpillar Tractor Co. has made available two booklets concerning tractor repair and service operations. Form No. D712, "Keep Them There," explains how to keep earthmoving equipment on the job by proper dealer service. Form No. D729, "At Your Call," explains how to keep down-time to a minimum.

Enter 730 on Reader Card

TRACTOR SHOVEL—Yale & Towne Mfg. Co. has made available a brochure covering its Model 154 Trojan tractor shovel. The brochure includes drawings and descriptions. Specifications are given, including standard and optional equipment lists.

Enter 731 on Reader Card

VALVE CATALOG—The Fairbanks Co. has published Catalog 57, covering its complete line of bronze and iron body valves. A table of equivalent resistance of valves, fittings, and bends, and charts for rational solution of pressure drop of liquids, gases, and steam as well as sectional views of the valves are included.

Enter 732 on Reader Card

WIRE ROPE CATALOG—Macwhyte Co. is offering several technical catalogs on wire rope: "Use and Care of Wire Rope;" S-8, "Wire Rope Slings;" 5601, "Wire Rope Assemblies;" 5702, "Excavating Equipment;" 5425, "Monarch Whyte Strand."

Enter 733 on Reader Card

USE THIS READER SERVICE CARD for additional information on:

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BUSINESS REPLY CARD
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READER-SERVICE CARD

RP-10-57

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[THIS INFORMATION WILL HELP US GIVE YOU ALL MORE SERVICE.]

Send information on items identified by key numbers beside or below items of interest to you. List your choice in numerical order. Limit 10 per card.

(1) ..... (2) ..... (3) ..... (4) ..... (5) .....

(6) ..... (7) ..... (8) ..... (9) ..... (10) .....

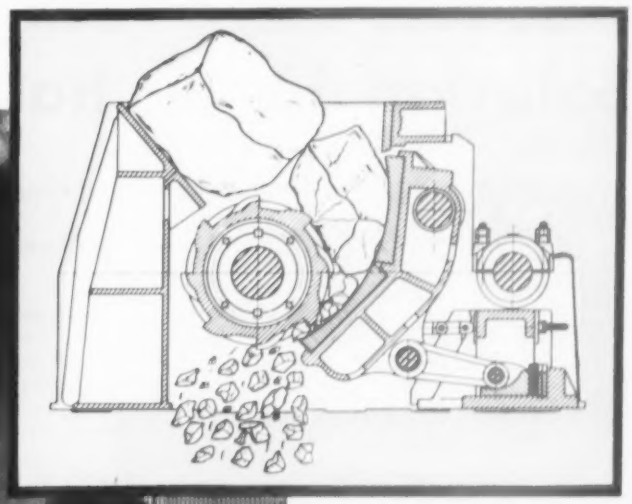
IF NO KEY NUMBER, USE COMPANY NAME

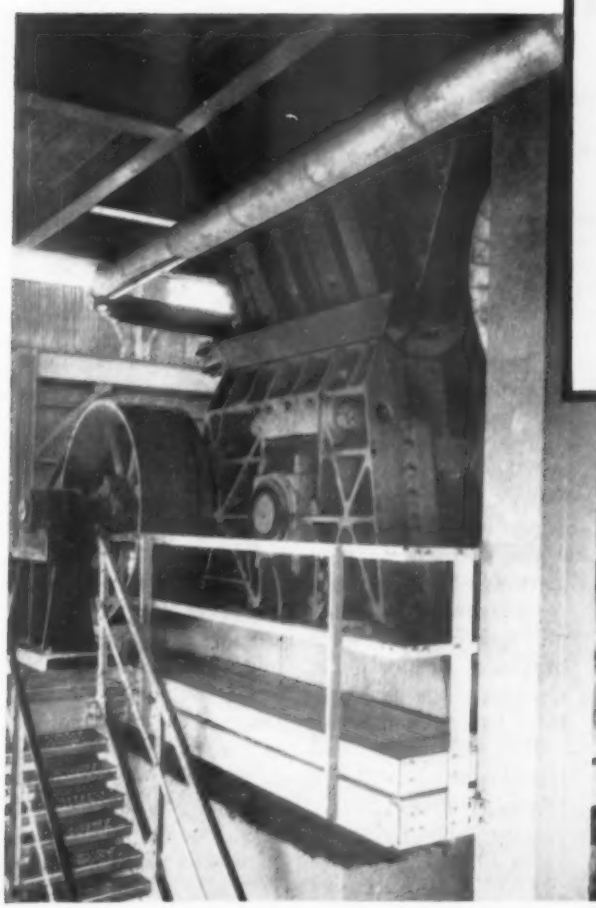
When a Single Roll fits the job make it a

PENNSYLVANIA

If you think large single rolls have limitations on capacity and ratio of reduction you can probably stretch these if you'll use the Pennsylvania. It'll easily handle wet or frozen materials that plug jaws, gyratories and conventional hammermills, and requires much less head room. For instance, a 30″ x 60″ Pennsylvania Penn-Lehigh takes only half the head room needed for a gyratory of equal capacity. And there are certain exclusive features in the compact heavy duty Pennsylvania. There's the adjustable breaker plate with reversible and interchangeable wear liners; the roll shell is all in one piece—no segments with frozen bolts or renewable teeth to work loose. Some of these single rolls have been in use over 30 years and are still going strong, with a cost per ton that is negligible. Remember, there's only one Penn-Lehigh Single Roll and Pennsylvania makes it. Ask us for details and crushing counsel.

PENNSYLVANIA CRUSHER DIVISION
Bath Iron Works Corporation
West Chester, Penna.





PENNSYLVANIA
SINGLE ROLL CRUSHERS

PE-214

Enter 1583 on Reader Card



Shovel loads 30 to 40 tons of stone into heavy-duty rigs

Needed: more rock tonnage Solution: larger haulage units

In an eight-hour shift, Dewey Portland Cement Co. can produce more rock today than it could working around the clock four years ago



Overall view of quarry at Davenport

BIG LOADS TO BOOST our tonnage was our main objective," said Norman D. Armentrout, quarry superintendent of Dewey Portland Cement Co's. Davenport, Iowa, plant. He was explaining the reasoning behind his company's selection of four 32-ton capacity tractor-trailer units to haul overburden, road stone and cement rock in the quarry several years ago.

At that time the company was faced with an unprecedented demand for cement for Iowa's growing industry, and for huge volumes of rock from contractors who were paving new highways and building up secondary roads. A careful study of quarry production methods concluded that the answer to the problem was the purchase of a few large haulage units, rather than more small trucks.

Now, all of the old 15-ton road type trucks have been replaced in the quarry with the new off-road trucks whose powerful 300 hp. diesel-powered tractors and rugged 25-cu. yd. trailer bodies haul 30 to 40 tons of material from the quarry faces to

Please turn to page 174



Chicago Gravel Co. feels that one good Manitowoc deserves another — that's why the company recently added another Manitowoc Model 2000 Clamshell to move gravel at its Rockdale, Ill., plant. Mr. G. E. Singletary, General Superintendent says, "We purchased this new Manitowoc 2000 Clam because we know we can count on simplicity of design and long operation, without much maintenance. The rig is very easy to convert from dragline to clam and back again. We have changed as often as *three times in one day* to suit some particular operation at hand. The line speed is well-suited for either bucket and the operator likes the machine very much."

Consistent high output is the rule with this rig. The Model 2000 moves 800 to 1000 tons of gravel daily, in addition to dragline excavation, and has put out as much as 1200 tons a day when loading railroad cars. The clam is also used for charging bins with gravel and stockpiling it for future orders.

See why more and more plants and quarries are turning to Manitowoc for increased production and trouble-free performance. Investigate the complete, profitable line of Manitowoc shovels, draglines and clams — available in 1-yd. to 5½-yd. to fit any job you have. Call your helpful Manitowoc distributor today!

Manitowoc Engineering Corp., Manitowoc, Wis.

SHOVELS
1-5½ YD.
Manitowoc
CRANES
20-100 TON

LOOK AT THESE MODEL 2000 *Features*

- Simple design with only 13 gears and pinions in the entire machine — only working gears turn.
- Exclusive slide pinion arrangement requires only one set of clutches to drive travel, swing and boom hoist.
- Real stability on any ground provided by a massive one-piece carbody mounted directly on crawler frames — long, wide crawlers — scientific weight distribution throughout the rig.
- Fast closing-hoisting line speed is 200 feet per minute with holding line speed even faster at 214 f.p.m.
- Smooth, positive control with plunger drum clutches; disc-type swing clutches; optional torque converter and air controls.

Enter 1534 on Reader Card



Side-dump trailers unloading stone into crusher hopper

More rock tonnage

continued from page 172

the primary crushers. By the time the third unit was put into service in 1956, quarry output had risen 50 percent to 4,800 tons in an eight-hour day.

The big rigs have been so successful that Dewey Portland has purchased a fourth heavy-duty side-dumping trailer as a standby. The new unit will probably see plenty of service when the cement plant calls for more rock and the distance from the working faces to the crushers gets greater.

Steady, dependable performance is considered more important for continuous production than high speed or heaping loads. The goose-neck frame trailers have often handled loads of 39 tons but Mr. Armentrout feels that 30 tons can be more quickly loaded out by the shovels and dumped more easily than overflow loads. There is much less spillage for the shovels or maintenance crews to clean up, and the crushers seem to operate more efficiently with smaller loads dumped more often.

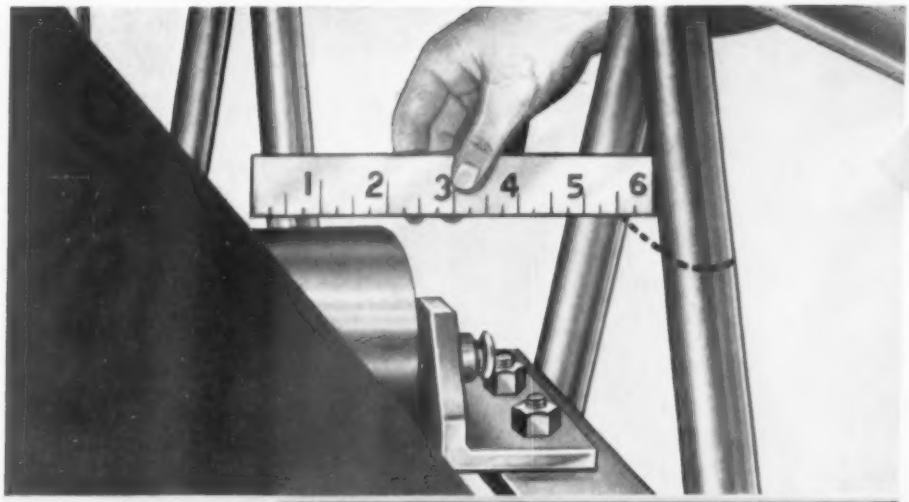
The operators agree that hydraulic side dumping is safer and faster than rear dumping for this plant. Each operator can watch where he is dumping and the hydraulic cylinders operate under the control of the driver during the dumping cycle. With accurate spotting of the truck at the dump hopper and with quick dumping, the rig can return to the loading shovel promptly. The time saved in this way adds many trips each day to each truck's operation.

Single shift loading in the quarry has freed the trucks to haul overburden on the second shift. The units operate continuously for 16 hours a day, pausing between shifts only long enough to change drivers.

The limestone ledge has 6 to 30 ft. of overburden—broken stone, clay and topsoil. This is loaded out into the trailers with two draglines with 2½-cu. yd. buckets, and is hauled to a spoil bank or to fill in a depressed area.

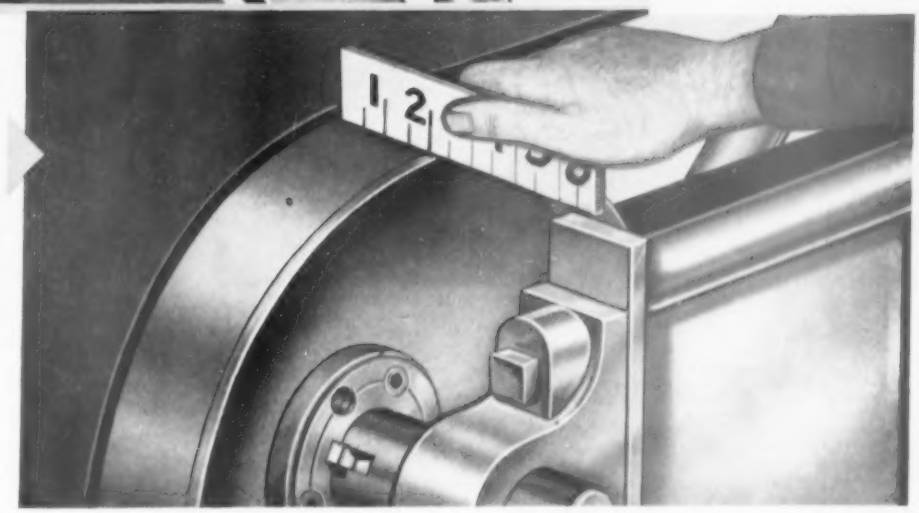
The quarry is worked on two levels. The upper level has a 40 to 80 ft. face of rock available for

Please turn to page 176



WIDER FRAME...
MARCO Tubular Frames are widest in the industry. They provide 100% more space (5½") in the critical area... between belt edge and nearest frame member. Pedestal type return idler brackets are used, instead of hanger brackets that confine and damage belt.

WIDER FACE PULLEYS...
MARCO is first with modern pulley specifications. 2" between belt and pulley edge... provides 100% greater protection than outmoded standards. Reduces possibility of belt destruction caused by "belt wandering" in high tension areas.



WHY RISK COSTLY, CONVEYOR BELT DAMAGE?

Only wider, MARCO Tubular Frame Conveyors provide maximum 'belt-edge' protection

Repairing or replacing conveyor belt represents the largest maintenance expense in a conveyor installation. To prolong belt life, MARCO conveyors are first to have all these belt-protecting features.

Wider Frame: Completely outmodes other conveyors that narrowly confine and damage belt should severe 'belt-wandering' occur.

Wider Face Pulleys: MARCO'S wider frame permits the use of modern, wider face pulleys to further protect belt from damage should 'belt-wandering' occur.

All Tubular Members: MARCO Tubular Frames are more rigid. Constructed of the strongest known structural member, these frames are modern ...and resist material and water build-up. Sharp 'belt-cutting' edges are eliminated with this exclusive construction.

Rigid Joint Construction: Another MARCO exclusive ... 4 bolts in each connection ... 16 in each joint. Not the usual 1 or 2 per connection. Joints are more rigid. Resists frame misalignment, simplifying belt training and increasing belt life.

If wind, uneven loading or other factors should cause 'belt-wandering'... with a MARCO frame you have the most complete protection possible against costly 'belt-edge' damage. This greater protection is yours at no greater cost.

MARCO'S Quality and Exclusive Features Mean More for Your Conveyor Dollar...

Remember, your conveyors are not mere plant accessories ... they deserve the attention of a specialized manufacturer offering modern specifications, carefully and properly designed to meet your most exacting requirements. It will pay you to check MARCO quality, exclusive features and proven performance record before you buy.

For more information see your Marco distributor or contact E. F. Marsh Engineering Co., St. Louis 10, Mo.

MARCO*

*Trademark Reg.

engineered MARCO products:

Tubular Frame Belt Conveyors · Conveyor Idlers · Solid and Self Cleaning Steel Pulleys
Bucket Elevators · Control Gates · Feeders · Bins

Enter 1516 on Reader Card



Windrowing in fill area on stripping operation

More rock tonnage

continued from page 174

N. D. Armentrout, quarry superintendent



both cement production and for sale to local contractors as road stone. The stone is easily broken but tends to be slabby. The two electrically operated shovels with 6 cu. yd. and 4 cu. yd. buckets load out this material into the trucks easily, but put aside slabs too large for the crusher to handle. The crusher is about 1,500 to 2,000 ft. from the working face and on the same level. Crushed material is taken to storage on the rim of the quarry with a belt conveyor.

The lower level of the quarry is worked for cement rock and for commercial stone. Here the well bedded rock is worked on a 40-ft. face. Blasting brings down hard, dense cubes of limestone which are loaded out with an electric shovel using a 4½-cu. yd. bucket. The primary crusher at this level delivers material to a belt conveyor to be carried to the raw material storage area in the cement plant.

EQUIPMENT USED AT DEWEY'S DAVENPORT QUARRY

Tractors ..... Caterpillar Tractor Co.
- 225 hp. DW 20 (1)
- 300 hp. DW 20 (3)

Trailers, TD1832 H, (4) ..... Easton Car & Construction Co.

Shovels ..... Harnishfeger Corporation
- Model 1600, 6 cu. yd. electric, (1)
- Model 1500, 4½ cu. yd. electric, (1)
- Model 1400, 4 cu. yd. electric, (1)
- Model 955ALC, 2½ cu. yd. dragline, (2)
- Model 855BLC, 2 cu. yd. dragline, (1)

END

Roebling Royal Blue Wire Rope will **wear** and **wear** and **wear**!



This working quality means longer service life on *your* job. Add to this the fact that Royal Blue is stronger than the strongest rope you have been using and you have two excellent reasons why it has enjoyed faster acceptance than any wire rope in Roebling's history. Your distributor or Roebling Sales Office will give you the complete story, or contact John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Distributors, Branches and Warehouses Throughout the Country—Subsidiary of The Colorado Fuel and Iron Corporation

Enter 1515 on Reader Card

Plibrico Refractories



THE "pro" OF proper PRODUCTS

There's nothing amateurish about the way Plibrico refractories get the job done. That's because there are no cure-all refractories in the Plibrico line, but rather specific types and grades tailored to calcining, drying and processing furnaces.

Here, in brief, are a few for your work.

Plibrico Super Air-Bond—an air setting plastic for severe combustion conditions; develops high strength through entire thickness.

Plicast K-L Mix—a dense castable with exceptionally high strength, uniform at all temperatures; highly abrasion resistant.

Plicast 15-R—Similar to the above but for use under more moderate temperature conditions.

Ask your Plibrico man for complete details. Write, too, for our catalog covering your applications.

Plibrico REFRACTORIES ENGINEERING CONSTRUCTION

PLIBRICO COMPANY • CHICAGO 14, ILL.

Plibrico Sales & Service in Principal Cities

Enter 1522 on Reader Card

Trade associations

continued from page 101

est voice often dictate association policy. As a member, you have a full voice in the operation of your association; if you don't like the way things are going, you should raise it. The majority will rightfully rule, and you may lose out on a particular point; but at least you've expressed your views and in the process have broadened your knowledge of the industry and its problems—while letting others know about your point of view.

One caution should be mentioned here. The worst thing that can befall a trade association is for its activities to be tempered always by fear on the part of the employes that they will do something to offend one of the members. Any activity undertaken by a trade association that pleases all members one hundred percent is probably so innocuous as to be downright useless. Almost any forthright action by an association is going to displease some of the members. If the association staff has to live in constant fear of such displeasure, then their work will be tremendously hampered. Association members should hire the best people available to carry on the work of the association—then should leave them alone to do their jobs. They should be held responsible, certainly, and removed if they don't perform satisfactorily. But their efforts should be channeled primarily toward solving the problems of the industry, and not pacifying a few loud and dissatisfied members. To hire the best available talent, then hamstring them with constant naggling restrictions is ridiculous; yet this sort of thing is common in many trade associations, and is in large part responsible for their inefficiency, where it exists.

There's a fine line to be found between taking a positive, active part in the affairs of the association while still leaving the association staff alone in handling, as it sees fit, the jobs it has been set up to do. The closer individual association members can come to this position, the more effective will be the work of the association and the more benefits they can expect.

Are you personally acquainted with association staff members?

Surprisingly, many association members have no personal acquaintanceship within the staff of the association. You are much more likely to take advantage of association services if you are acquainted with the personnel. You should make it a point to meet them the next time you are in the vicinity of association headquarters, or ask asso-

Please turn to page 180

Portrait of a producer

enjoying his trouble-free SECO screens

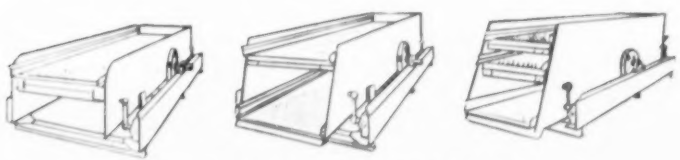


SECO

TRUE CIRCULAR ACTION

VIBRATING SCREENS

Of course, you can't see any SECO screens in this hunting scene. They're back on the job doing their duty while this successful operator is enjoying the fun and challenge of bagging his limit. That's the point . . . whether you're an avid hunter or not . . . with dependable SECO vibrating screens on your job, you know you can get away occasionally and enjoy the things you like with a free mind. Modernize your plant now with smooth operating, troublefree SECO vibrating screens. You'll be glad you did!



Over 350 models. A right SECO for every job.

Go modern! Put Seco screens to work for you!

SEND FOR CATALOG #204

SCREEN EQUIPMENT CO., INC.

Buffalo 25, N. Y.

Enter 1659 on Reader Card



Maiden Rock Co. Sizes Sand to 98% Accuracy with Six 48" SWECO Separators

Six 48" diameter SWECO Vibrating Screen Separators are sizing sand into three main classifications – in a process approaching 98% accuracy – for Maiden Rock Silica Sand Company of Maiden Rock, Wis. The accepted commercial tolerance in this area is 85%.

Maiden Rock's sand production is classed as minus 10 plus 30 mesh, minus 20 plus 40 mesh, and minus 40 plus 60 mesh. These special size requirements are easily handled by simply changing the screens on the SWECO Separators. Screen life with this abrasive material averages from four to six months and maintenance costs have been considerably less than they were with other screening equipment.



Close "nesting" of SWECO Separators in screen room of Maiden Rock Silica Sand Company takes minimum floor space. Efficiency of the units is not hampered.

By improving quality and providing the accurate separation its customers require, Maiden Rock has boosted demand for its sand products. The company is replacing all other types of screening equipment with efficient SWECO units that lower maintenance costs and increase production capacity.

Screening Analysis and Recommendations Available

Your nearby SWECO District Engineer is available to help you with special screening problems. His "know-how" covers over 200 different materials...wet and dry, coarse and fine, heavy and light. He has an 18" SWECO Separator available, to demonstrate in your plant how this equipment can screen your material. No obligation, of course.

A complete data file on screening rock products plus a 22-page catalog are yours for the asking. Write for Bulletin S-107-14.

SWECO
SEPARATORS

SOUTHWESTERN ENGINEERING COMPANY
4800 Santa Fe Ave., Los Angeles 58
LUdlow 3-6262— Cable: SWECOLA

Engineers and Constructors . . . Manufacturers
Enter 1526 on Reader Card

Trade associations

continued from page 178

ciation representatives to drop by and see you whenever they are out your way.

To sum up, trade associations offer five very distinct and very important advantages to the industries they serve:

—Associations create a demand for your product by giving it a high-pressure national sell in a day-and-age when this is almost essential to meet competition. Local dealers, no matter how much they spend, would find it impossible to duplicate the benefits of this national sales promotion activity with purely local sales efforts.

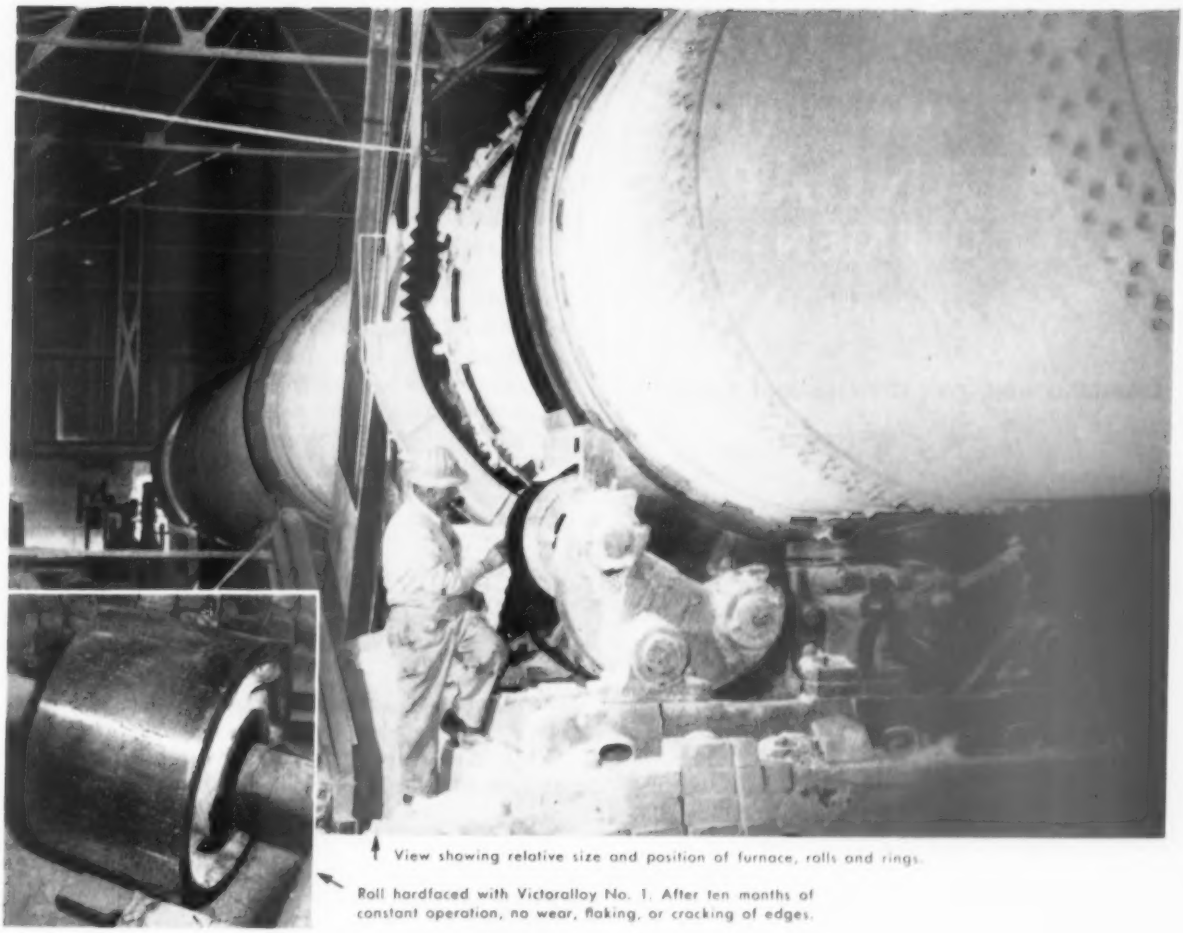
—In this highly competitive period of steadily advancing technology, there must be constant and consistent efforts to improve your product. This can be accomplished only through research and development work requiring expensive facilities and expensive technicians. Again, the trade association provides the most convenient and economical answer.

—Technical problems that are arising constantly in the rock products industries are often beyond the knowledge or experience of the local dealer. But he can turn quickly to his trade association for the help and advice of specialists—not only in the technical end, but also in sales promotion, labor relations, safety and many other areas.

—More and more in these days of Big Government, decisions made by politicians and businessmen at the national level have a profound effect on you in your community. The trade association acts as your watchdog at the national level, speaking up for you where no voice would otherwise be heard. There are many occasions when special interest groups need to have their story told by people qualified to tell it. The trade associations that openly perform this function are contributing a helpful service for everyone concerned.

—And, finally, there is an intangible community of interests that goes along with membership in a trade association—the opportunity of meeting and knowing and sharing common problems with other people engaged in the same activities as you. Informal pooling of information at association functions can be decidedly helpful to you. So, too, is the feeling that you have been able to be of service to a fellow-businessman. Such a feeling of

Please turn to page 182



View showing relative size and position of furnace, rolls and rings.

Roll hardfaced with Victoralloy No. 1. After ten months of constant operation, no wear, flaking, or cracking of edges.

A case of wear and tear... and how Victoralloy solved it

PROBLEM:

The 300-ton furnace of Diamond Springs Lime Company, Diamond Springs, Calif., rolls on 16 centered 30-40 carbon steel rolls. The furnace's heavy weight and terrific heat caused the rolls to flake and crack at the edges. This in turn caused the furnace roller-rings to begin disintegrating. How to stop the wear and tear before an expensive shutdown and complete replacement of rolls and roller-rings became necessary?

SOLUTION:

Herbert Green, superintendent, and John Desson, general foreman, hardfaced the rolls with Victoralloy No. 1 Coated-Electric. Checking after ten months of operation, they found the case solved: no flaking of rolls, no cracking at the edges, and no disintegration of furnace roller-rings.

You, too, can solve cases of wear and tear on operating parts with Victor hardfacing alloys. Complete line of 26 different alloy rods assure you a right rod for every hardfacing need. Full range of sizes for both acetylene and electric AC and DC applications, either hand or automatic. Order from your Victor dealer TODAY.

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VICTOR for hardfacing

H-40 **VICTOR EQUIPMENT COMPANY**

ALLOY ROD AND METAL DIVISION

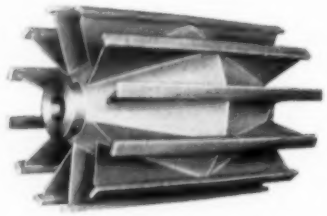
13808 E. Imperial Highway, Norwalk, Calif. · Wakita, Oklahoma

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SAVE MONEY
IN MATERIAL HANDLING
with STANDARD
EQUIPMENT

STANDARD WING-TYPE SELF-CLEANING PULLEY

- LOW COST
- LONGER LIFE
- GREATER STRENGTH WITH LESS WEIGHT



Reinforced all-steel welded construction of this Standard Pulley provides longer service, lower operating costs, greater efficiency. Built to deliver maximum service under severe operating conditions, the self-cleaning design combines far greater strength with less weight.

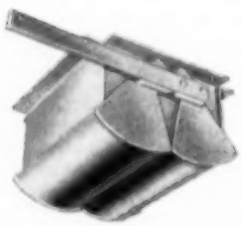
CONTINUOUS ELEVATOR BUCKET STYLE #2



This style of bucket is just one of several types of steel elevator buckets manufactured by Standard. All Standard Buckets are built to provide exceptional resistance to wear . . . to give longer service and lower costs. Available in Salem, Style "A," shelf type and other continuous style buckets for all types of operations.

STANDARD BIN GATE

Easy-to-operate, fast and efficient, this Standard gear-operated Bin Gate results in greater output in less time with lower labor costs. All-steel welded construction for longer life. Other styles of Standard Bin Gates also available.



To lower costs, specify Standard equipment for new installations or replacements. Write today for catalog showing the complete line of Standard products.

SM2

The Standard Metal Mfg. Co. SINCE 1921

STANDARD METAL MFG. CO.
110 CENTER ST. MALINTA, OHIO

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Trade associations

continued from page 180

comradeship and belonging can mean much in making the operation of a business more fruitful and satisfying.

The rock products industries are fortunate to have a large group of effective, dedicated trade associations available to individual businessmen within the industries. If you are not a member, it might be worthwhile for you to reassess your business in the light of the services these associations offer. And if you are a member, you might profitably give some thought to how you can better contribute to—and at the same time, benefit from—the work of your association.

END

Job analysis

continued from page 107

them vertically, in order of importance. The lists are then combined into one company organizational chart. With this system, it is essential to check and double-check to avoid disagreement.

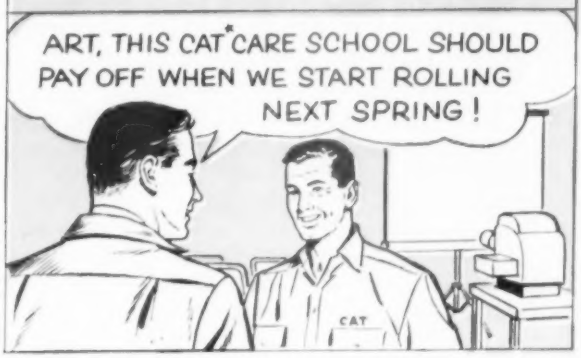
Job classification system. Under this system, a number of categories or grades are established in advance, and the jobs are then assigned to these classifications. Such a method presupposes that every job in your company contains definite elements or phases that can be classified into grades. The grades are then established on the basis of difficulty and responsibility, as represented by the number and kinds of rules regulating the work being done, and by whether or not, and how often, the work is subject to check. The success of such a job-measuring stick depends on a thorough knowledge of all the jobs, so that every work element may be taken into consideration, and the duties and responsibilities of every worker clearly distinguished.

The point system. This method is the most widely used today, and it is rapidly gaining still greater acceptance. A number of predetermined factors such as age, education, years of training, experience needed, physical effort involved, etc., are found to be common to all jobs. A schedule of points is then set up for the various gradations of each factor. Each level should be strictly defined, so that consistent interpretation may be made. The levels or grades in each factor should be expressed or defined in writing, and it is also desirable to have each definition accompanied by examples of

Please turn to page 184

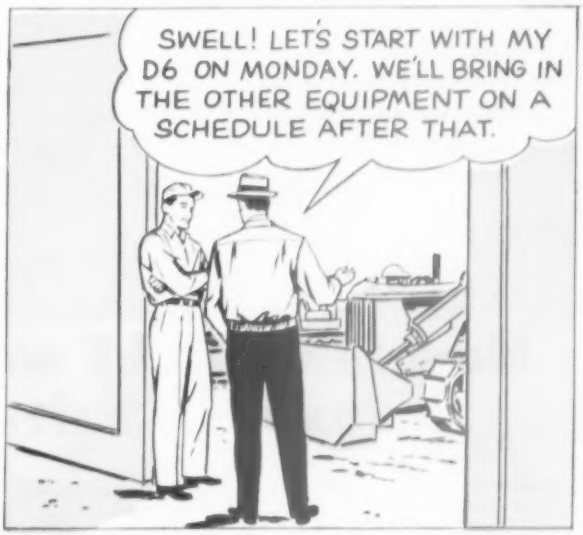
THE CASE OF

THE OWNER WHO THOUGHT AHEAD













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Job analysis

continued from page 182

standard or well-defined jobs that are based on consideration of the following: the abilities which a worker brings to the job; the extent to which he is called upon to use these abilities; the responsibilities which the employer demands on the job; and, the conditions under which the job must be performed. When the individual job factors have been evaluated, the sum of the job factors should be well under the total points of the system.

Factor comparison system. There are several differences between this method and the point system. One is that the graded factors are assumed to be fundamental to all jobs. Another is that jobs are evaluated relatively, using certain existing jobs as points or degrees on the evaluation scale, rather than depending on descriptive definitions. This system has the advantages of simplicity and of establishing a fixed relationship between job value and actual compensation since it is based on key jobs for which compensation is standard or, at least, not subject to controversy. Once the key jobs have been selected, they are ranked from highest to lowest in order of importance. After the ranking, however, the key jobs are evaluated by study and examination of individual job descriptions. All other jobs are then related to the key jobs and the final result is an agreed-upon, company-wide grading system.

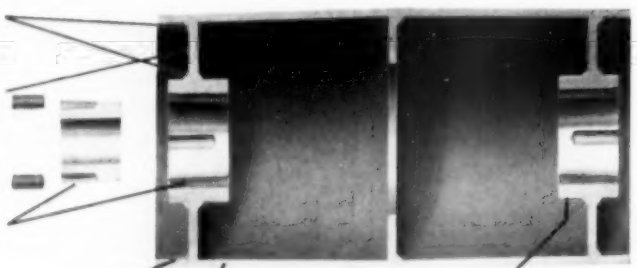
Contrary to popular belief, management need not necessarily engage outside counsel to install such a system. All that is essential is reasonable intelligence, objectivity and a willingness to do the work. There is no reason why the employment manager or foreman cannot collect complete, accurate job descriptions by having employes fill out a questionnaire.

In making a job anaylsis for evaluation purposes, the interviewer should talk to workers and supervisors. Both can help to provide a picture of typical job duties and the kinds of information needed to perform the duties adequately. Critical areas of knowledge may also be identified by observing the characteristic differences in job performance between the most competent and least efficient workers.

Employers generally favor job evaluation because they are assured of a relatively stable unit personnel cost and incentives toward greater employe efficiency. A system which rewards the worker according to his skill and industry is both equitable and desirable.

END

How LINK-BELT welded steel pulleys extend belt conveyor life



SUBMERGED ARC WELDS connecting rims and hubs to end discs are as strong as joined members.

END DISCS are machined for true concentricity. Welds provide fully enclosed assembly.

TAPER LOCK BUSHINGS assure full compression grip — even on inaccurately finished shafts.

MINIMUM RIM OVERHANG prevents dirt buildup. Smooth pulley surfaces protect belt.

PURE RUBBER LAGGING is vulcanized to pulley for life. Choice of plain or herringbone.

MINIMUM OVERHUNG LOAD is assured. Bearings can be positioned close to hubs.

Taper lock bushings speed installation

Longer conveyor belt life depends on smooth-rolling, smooth-surface pulleys. Link-Belt welded steel pulleys with taper lock bushings meet these exacting requirements — drive the belt without slip, in a straight path with regulated tension. In addition, taper lock bushings simplify mounting.

Diameters: 6 to 60 in.; faces: 12 to 66 in.; for $1\frac{15}{16}$ to 10-in. shafts. See your Link-Belt factory branch store or authorized stock-carrying distributors.

EASY ON ◄ ► **EASY OFF**



Insert bushing in hub, align holes and keyseat, slide shaft into place.

Insert and tighten screws in holes which are threaded in hub half.

LINK-BELT

WELDED STEEL CONVEYOR PULLEYS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14.283



Remove screws, screw one into half-thread hole in bushing.

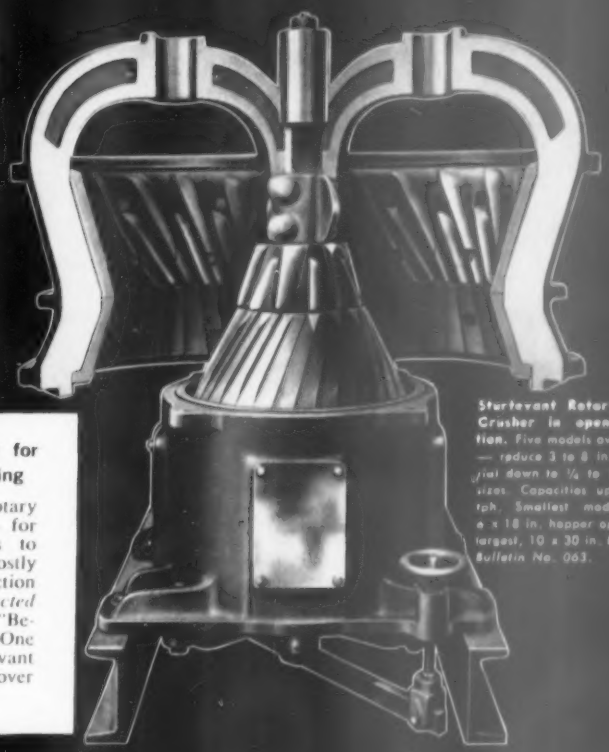
With bushing released, shaft can easily be slipped off pulley.

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PRODUCTION ALWAYS ON SCHEDULE

Thanks to

"OPEN-DOOR" DESIGN



Sturtevant Rotary Fine Crusher in open position. Five models available — reduce 3 to 8 in. material down to ¼ to 1½ in. sizes. Capacities up to 30 tph. Smallest model has 6 x 18 in. hopper opening; largest, 10 x 30 in. Request Bulletin No. 063.

"One Man, One Minute" Accessibility for Inspection, Clean-outs, Trouble-shooting

One man can swing open a Sturtevant Rotary Fine Crusher in a matter of minutes — for inspection and maintenance — thanks to Sturtevant's unique "Open-Door" design. Costly downtime is cut to a minimum, production kept on schedule — *even when the unexpected happens.* Little wonder that users say: "Because of their rugged construction and "One Man, One Minute" accessibility, Sturtevant machines give us *lower* operating costs over *more* years."

STURTEVANT ROTARY FINE CRUSHERS REDUCE SOFT TO SEMI-HARD MATERIALS FASTER, MORE ECONOMICALLY

For uniform crushing of soft (clay, charcoal) to moderately hard materials (softer limestone, cement clinkers), the Sturtevant Rotary Fine Crusher is practically non-clogging — much faster than other machines, less costly to operate.

Smooth production flow. The single turning of a hand wheel regulates the output size (from ¼ to 1¼ in. on largest model) — provides a uniform product, dustless operation, steady output for greatest production efficiency.

A lifetime of low-downtime service. Built into Sturtevant Rotary Fine Crushers is Sturtevant's 83 years of successful engineering of dry processing units and equipment. Rugged construction, plus easy accessibility provided by Sturtevant's unique "Open-Door" design, assures more output per machine year.

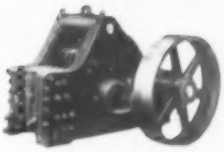
Write today, Address: Sturtevant Mill Company, 102 Clayton St., Boston 22, Mass.

STURTEVANT

Dry Processing Equipment

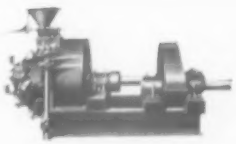
The "OPEN-DOOR" to *lower* operating costs over *more* years

CRUSHERS • GRINDERS • MICRON-GRINDERS • SEPARATORS
BLENDERS • GRANULATORS • CONVEYORS • ELEVATORS



JAW CRUSHERS

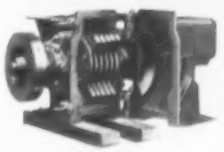
Reduce coarse (5 in. largest model) to fine (⅛ in. smallest model). Eight models range from 2 x 6 in. jaw opening (lab model) to 12 x 26 in. Capacities to 30 tph. All except two smaller sizes operate on double cam principle—crush twice per energy unit. Request Bulletin No. 062.



RING ROLL MILLS

Reduce hard or soft 1½ in. and smaller material to from 6 to 200 mesh. Grind only — no screens. Capacities of 3 models range up to 18 tph, depending on model and material. Ring diameters and faces 24 x 7 in.; 45 x 8 in.; 44 x 14 in. Request Bulletin No. 079.

ALL STURTEVANT MACHINES ARE DESIGNED TO OPERATE ADVANTAGEOUSLY IN "UNITS"



HAMMER MILLS

Reduce to 20 mesh. Swing-Sledge Mills crush moderately hard material up to 70 tph. Hinged-Hammer Pulverizers crush softer material at rates up to 30 tph. Four Swing-Sledge Mills with feed openings from 6 x 5 in. to 20 x 30½ in. Four Hinged-Hammer Pulverizers from 12 x 12 in. to 12½ x 24 in. Request Bulletin No. 084.



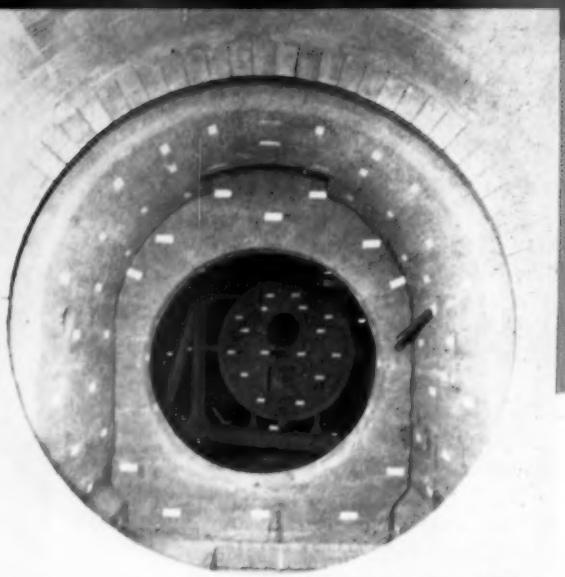
CRUSHING ROLLS

Reduce soft to hard 2 in. and smaller materials to from 12 to 20 mesh with minimum fines. Eight sizes, with rolls from 8 x 5 in. to 38 x 20 in.; rates to 87 tph. Three types — Balanced Rolls for automatic adjustment in operation; Plain Balanced Rolls; Laboratory Rolls. Recomended for 3 to 1 reduction. Request Bulletin No. 065.

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A. P. GREEN . . . SUPER HYBOND

JOB-ENGINEERED MONOLITHIC KILN FIRING HOOD



A. P. Green job-engineered monolithic refractory linings readily meet the complex construction requirements and varied service conditions in rotary kiln firing hoods. Furthermore, they offer specific advantages which can be money-savers.



The photograph illustrates A. P. Green SUPER HYBOND as recommended and installed in a typical firing hood. Notice the joint-free surfaces and positive anchorage throughout the lining. These features provide maximum protection against premature failure resulting from dust penetration, bulging, and buckling. Complicated, expensive masonry has been eliminated, as have resulting structural weaknesses.

SUPER HYBOND is a natural choice for such installations. It is a super duty plastic that develops high strength throughout the entire thickness of the lining—increasing the holding power of the anchors. Its high refractoriness readily withstands excessive temperatures, such as might occur in the seal ring or crown areas. Spalling and abrasion resistance are excellent.

A. P. Green offers a complete line of refractory products for the cement and lime industry. Whatever your requirement, for specific recommendations without obligation, contact your local A. P. Green Distributor . . . he's listed in the yellow pages of your telephone directory.

A. P. GREEN FIRE BRICK COMPANY

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IN CANADA: A. P. Green Fire Brick Co., Ltd., Toronto 15, Ontario

A. P. Green REFRACTORY PRODUCTS
SERVE THE WORLD'S INDUSTRIES

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Vertical cement kilns

continued from page 111

The shaft kilns are fed by pan nodulizers which yield a firm nodule between ¼ and ¾ in. diam., averaging ½ in. diam. Moisture content varies from 13 to 13.5 percent, and the nodules have good burning properties.

Of the three existing kilns, two were supplied by Krupp of Rheinhausen and one by Von Roll of Zurich. The first of the three new kilns is by Von Roll. They vary only slightly in dimensions and action. The steel casing of each is 30 ft. high and about 10 ft. in diam. and is funnelled out at the top to 12 ft. diam. It is lined similarly to a rotary kiln in that the top 3 ft. has high alumina bricks for the preheating zone, followed by magnesite of burning zone quality, alumina bricks down to the 13-ft. level. Below this in the cooling zone are lower grade alumina bricks.

The burning process in rotary kilns relies on radiation from the flame and the conduction of the brickwork. These methods of heat transfer are replaced in the shaft kiln by burning of the fuel inside the raw meal. Hundreds of feet of rotary kiln and cooler are replaced by a combined unit 30 ft. in height while achieving maximum fuel economy.

Wet nodules entering the top of the kiln are spread by a rotary chute, and in the top 3 ft. of the kiln the nodules are dried and calcium carbonate decomposed. These two heat-absorbing actions cool the spent gases blown up from the burning zone immediately below to 60 deg. C. exhaust gas temperatue. The burning zone consists of a dense layer only a few feet thick in and below the neck of the cone. Burning of the fuel and reaction of the meal is accompanied by contraction and compaction so that the material just fills the reduced area of the shaft. This eliminates channelling should air blown in at the base of the kiln reach the burning zone at too high a velocity. The bottom half of the kiln may be regarded as cooler for material and preheater of the air needed for combustion. Clinker withdrawal is at an average of 300 deg. C., including some red hot material drawn from the center and cold material from the periphery.

Burning control is by instruments, although smoke appearance is of some value in judging the depth of the fire below the surface. The burners control the rate of input of material, the percentage of fuel, the rate of extraction of burnt clinker, and the volume of air blown in at the base of the

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We use Colmonoy No. 2, the Best Hard-Facing!"

You get top abrasion resistance and easy welding with low-cost Colmonoy No. 2 hard-facing electrodes. Use them on tractor treads, dipper teeth, ditcher teeth, truck beds, dragline buckets, any steel or manganese steel part.

Excellent arc stability and good flowing qualities make these low hydrogen AC-DC electrodes a cinch to apply. A Colmonoy No. 2 deposit has a Rockwell C hardness of 50 to 60.

Write today for more information about Colmonoy No. 2 and the rest of the Colmonoy family of hard-facing alloys.

HARD-FACING ALLOYS

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Available in 1/8, 5/32, 3/16, and 1/4-inch diameters, packed in 10-lb. sealed metal containers.



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Vertical cement kilns

continued from page 187

kiln. These factors are controlled to hold the burning zone in the neck of the kiln. The volume-pressure ratio of the air entering the kiln indicates conditions in the kiln, with high ratios indicating channelling of the air or a loose underburnt structure in the kiln. A low ratio may indicate overburning with fusion and compaction of the material, that the fire is temporarily too deep, or that the wet nodule layer, (which has a high air resistance) is too thick.

The bottom of the kiln is a steel rotating grate that forms the load-bearing base for the material in the kiln. Beneath the grate the burnt clinker falls by gravity through three sluice boxes, permitting withdrawal of the clinker without loss of pressure. Air is supplied beneath the grate from a Roots blower passing a maximum of 8,000 cfm. at 80-in. wg.

The clinker leaving the sluices falls to a vibrating conveyor which forwards it to duplicate slag breakers crushing to 1½ in., then to duplicate elevators and into the main storage. The present Krupp three-chamber mill is powered through multiple gearing by a 1,040-hp. motor. This unit, originally guaranteed for 18 tph., grinds an average of 24 tph. to a Blaine surface area of 3,300 cm.² g. at the low power consumption of 24 Kwh./ton.

This mill will be secondary to the new 30 tph. Krupp air-swept two-chamber mill now on order. This is coupled with a 4.5m. diam. air separator and is expected to give more than its rated output. The 2,500-ton capacity silos will be duplicated. The chain conveyor system of extraction is to be retained. Chain conveyors feed into a common screw for each three silos, and these screws, in turn feed the present three-spout Haver and Boecker packing machine. This machine is to be augmented by a four-spout machine; facilities for bulk loading.

Clinker can be over- or underburned in shaft kilns as in rotary kilns. A familiar feature of the old vertical kiln was the high amount of completely unburned material. This has been eliminated by coning the upper part of the kiln to stop the channelling that allowed raw material to fall through the burning zone. The old system of clinker return where the clinker was screened after crushing and where the underburnt, easily crushed fines were recycled to the feed is no longer necessary. This procedure was advocated as a method of improving our fuel efficiency burning and production. However, during a trial with our raw materials and methods of mixing, these "improvements" were not needed.

END

E X P E R T I Z E

FOR LESS THAN A PENNY A DAY YOU CAN ADD AN EXPERT TO YOUR STAFF . . . AND, NOTHING TO YOUR PAYROLL.

ROCK PRODUCTS' to-the-point editing gives more features each issue than ever before.

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There is a DIFFERENCE in ROCK PRODUCTS' authoritative coverage of your industry. Make sure that all key people in your plant receive and read ROCK PRODUCTS.

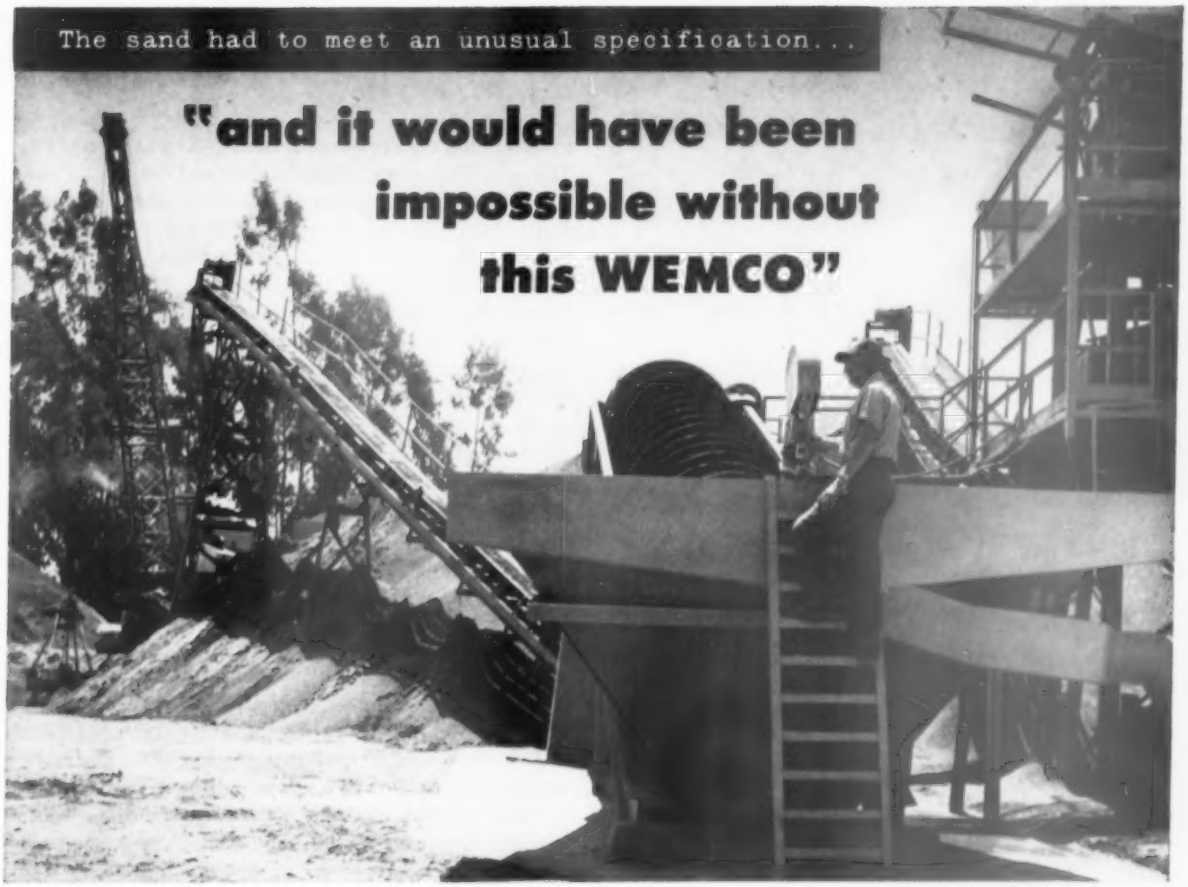
Ask about our special GROUP RATES for more than one, and more than three subscriptions to a plant.

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E X P E R T I Z E

The sand had to meet an unusual specification...

"and it would have been impossible without this WEMCO"



When the Niles Sand and Gravel Company got the sand and aggregate order for the Ford Motor Company's new assembly plant in Milpitas, California, it was on the basis of an exceptionally rigid sand requirement. It has now been successfully fulfilled, and H. G. Clouser, Niles plant superintendent, reports, "this would not have been possible except for the adaptability of our 60-inch Wemco Sand Preparation Machine".

With 60,000 yards of concrete being poured on this one Ford plant, the fineness modulus was not permitted to vary more than 0.2%. Plus 200 mesh fines had to be retained in correct proportion and – 200 mesh had to be eliminated as completely as possible. A continuous materials testing program was under the direction of Hales Laboratories of Oakland.

After his experience on these very exacting requirements, Mr. Clouser of Niles Sand and Gravel Company states, "I believe that the Wemco Sand Preparation Machine, intelligently used, can meet practically any desired sand specification." "It has proven particularly adaptable to various operational changes we have made." "The hydraulic screw lift makes it readily adjustable to day-to-day pit variations." "And it has been one of the most troublefree pieces of equipment in our plant (three years running on its original wear shoes)."



Plant operator Tom Brannon using the hydraulic spiral lift. This simple adjustment compensates day-to-day pit variations, and in locations where freezing is a problem may also be used to break surface ice (eliminating the need for draining the tank for overnight shutdown).

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WESTERN MACHINERY COMPANY

650 FIFTH STREET • SAN FRANCISCO 7, CALIF.

Representatives in principal cities of the United States and Canada and in major countries throughout the world.

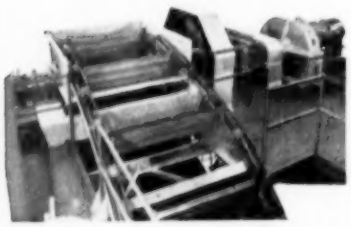
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A Honey of a Screen
for
More Strength
More Capacity
and
Engineered Performance
Look for this stamp on
all "Cross" Products
The Sign of PLUS QUALITY for PLUS PERFORMANCE
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PCA's research lab

continued from page 132

thin-bonded concrete resurfacing on 40,000 sq. yd. There has been an insistent demand for such data from highway engineers and other users of soil-cement. To further these studies nine test panels 10 x 12 ft. and 4, 8 and 10 in. thick, have been built on the laboratory grounds. Three of the panels are granular soil-cement, three are clayey soil-cement and three are crushed limestone without cement. Instruments have been placed so that deflections caused by various loads as well as pressures on the subgrade can be recorded. Indications thus far are that pressures on the sub-grade under the soil-cement were considerably lower than under the crushed stone.

The scheduled completion of the Association's new Structural Laboratory early in 1958 foreshadows a greatly augmented program toward extension of present uses and development of new applications of structural concrete. Large scale tests and experimental work, impossible with facilities available previously, are in preparation. Although the field of structural concrete is many sided, the Association proposes to follow the overall objectives through three major avenues:

—To develop engineering information necessary for the furtherance of new and improved structural applications such as precast concrete, shell structures and flat plate floor slabs;

—To gain more knowledge of the structural properties of concrete, with especial emphasis on precasting, prestressing and use of high-strength conventional bar reinforcement;

—To further structural design in concrete by means of modern improved design methods and concepts, such as ultimate strength design and limit design.

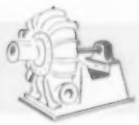
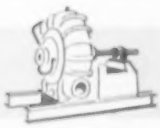
As might be expected, prestressed concrete is one of the major fields of interest to Association research engineers. It is pointed out that prestressed concrete developments in the United States are somewhat different from European developments. Pretensioned seven-wire strands are coming into general use in the United States. Engineers believe that this is especially suited to American requirements for both bridges and building construction.

Among the most interesting of the specific test projects relating to structural concrete, will be those on full scale hyperbolic paraboloid thin-shell roofs coming into use for one-story industrial buildings. One of these roofs, to be a 30 x 42-ft. shell, 1½ in. thick, supported on two columns, is scheduled for testing as soon as the Structural laboratory is in operation.

Please turn to page 192

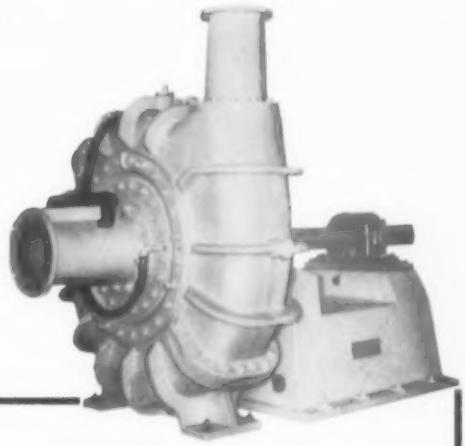



Another Customer Speaks

Mr. Tinker Puts His Experience With A Thomas Pump into Two Words: ---

"ASTONISHING DURABILITY"



No wonder Mr. Tinker is enthusiastic about the "astonishing durability" of his Series FL Thomas pump. There is a gleam in his eye when he compares his monthly repair bills on his old-style conventional pump, with the once-a-year repairs on his Thomas pump. A Thomas pump needs far less repair because its wearing parts are made of genuine Thomas Ni-Hard, and the pump is especially designed to complement the metal.

Tinker Sand & Gravel Company, producing sand and gravel on the Tennessee river, is growing. Mr. Tinker states he will need a larger pump next Spring, and he says: "Of course, it will be another Thomas."

So it is that, regardless of sizes of the operation, whether pumping from a river, lake or pit, the experience of Thomas pump users piles up proof that—

Tinker Sand & Gravel Company

J. L. TINKER, Manager

WASHED SAND & GRAVEL
Manufacturers of Concrete Building Blocks
Telephone [redacted] 2871

PARSONS, TENNESSEE
August 26, 1957

Thomas Foundries, Inc.,
Birmingham, Alabama

Gentlemen:

In July 1955, we installed a Thomas Pump on our dredge. We are very pleased with the results. Its durability is astonishing.

With the old pump, we made monthly repairs --- now it is only necessary to make yearly repairs.

Of course, the elimination of the costly down time has pleased us very much. We are now able to meet the demands for sand and gravel by having stock piles large enough to take care of any rush job.

We are glad to recommend the Thomas Pump to anyone. They can't buy a better, long-lasting sand and gravel pump.

Yours very truly,

TINKER SAND & GRAVEL CO.

J. L. Tinker

"YOU CANNOT BUY AT ANY PRICE A MORE DURABLE PUMP FOR SAND AND GRAVEL—YOU CANNOT BUY ANOTHER PUMP THAT WILL MAKE YOU AS MUCH MONEY."

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	Wide Range of Sizes and Weights:						
Pear shape (lbs.)	1500	2000	3300	4000	5200	6500	8000
Ball shape (lbs.)	500	1000	2000	5200			
Spherical shape (lbs.) (for magnet use)	470	950	1650	2400	3000	3700	5400

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PCA's research lab

continued from page 190

Studies of lightweight aggregate concrete were carried out by the Development department during 1957. The object was to obtain data leading to more effective use of lightweight aggregate in reinforced concrete structural members both ordinary and prestressed. Seven of the lightweight aggregates produced concrete in a strength range of 3,000 to 4,500 psi. and two of the lightweight aggregates gave concrete strengths of 7,000 to 9,000 psi. The information sought included data on strength, elasticity, creep, shrinkage, shear resistance, deflection characteristics and coefficients required to design beams by the ultimate strength method. The studies also sought to obtain additional data on the properties of lightweight concrete given accelerated curing as is done in many precasting plants. The investigation of creep deflection in lightweight concrete beams both conventionally reinforced and prestressed will be continued in 1958.

The Development department also reports that unusually attractive precast concrete panels have been made in the laboratory by a process worked out in cooperation with the U. S. Rubber Co. The panels, one type of which presents the appearance of having been glazed, are cast against a new rubber-plastic form material. This material, when heated to about 350 deg. F., can be molded over a wood pattern by pressure. No oil is required on the form. Development work is continuing on this material.

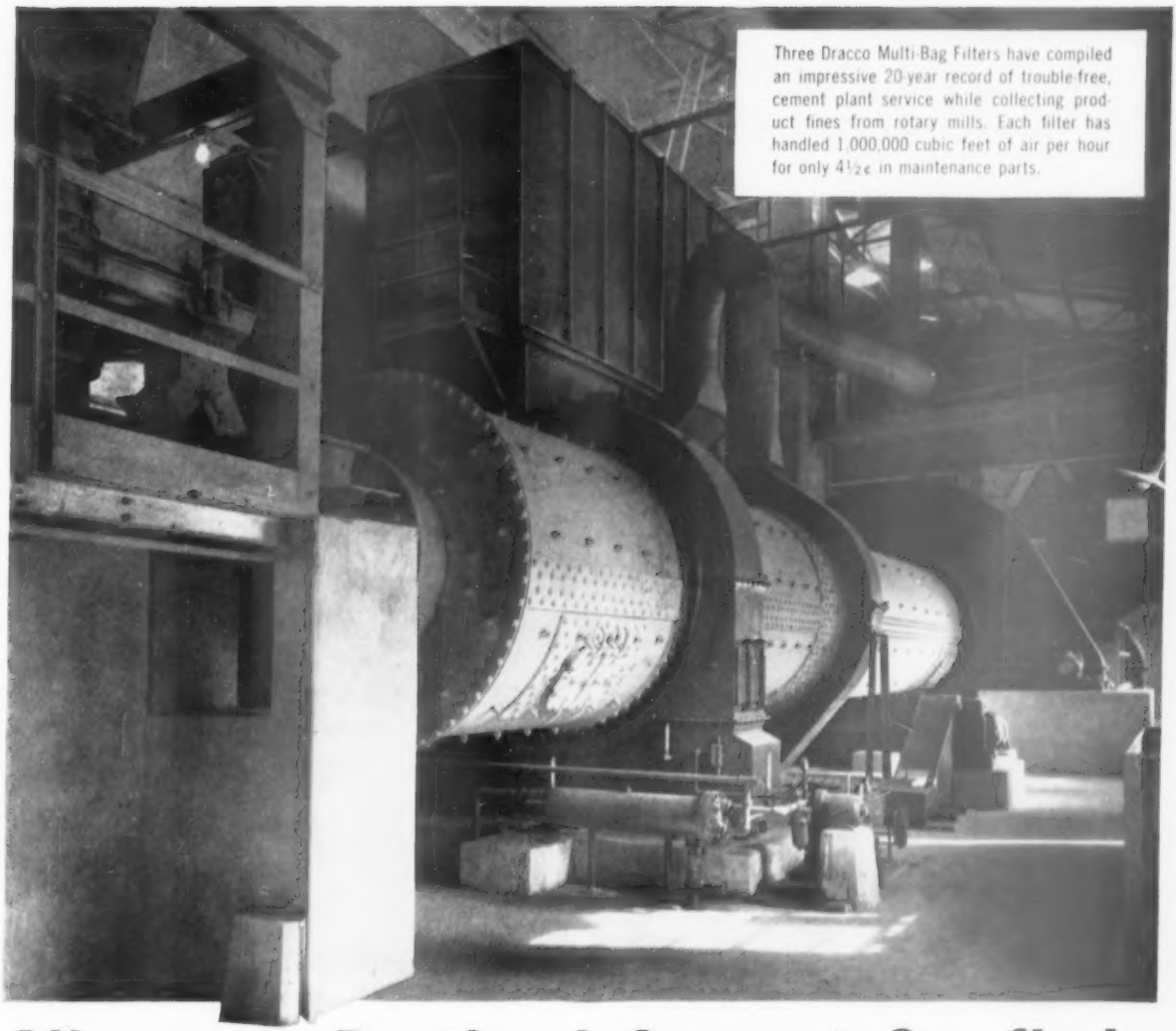
In a foreword to the Laboratory's 1957 yearly report, Dr. A. Allan Bates, vice president for research and development, emphasized the fact that the past work of Portland Cement Association Laboratories has had a profound influence on the changing appearance of American cities.

"Our new facilities," he said, "the Structural Laboratory, the Fire Research Laboratory and others being planned will multiply many fold the impact of the portland cement industry on modern and future building practice."

"These new facilities," Dr. Bates said, "are oriented largely, though not completely, toward applied studies with a trend to new and special aspects, (1) large, almost 'full-life' scale, and (2) uses and properties of complete building assemblages rather than a single structural beam, or a single column. Our future plans must move more quickly and boldly in these directions."

The projects described in this article were planned and conducted under the supervision of Hubert Woods, director of research, and Douglas McHenry, director of development.

END



Three Dracco Multi-Bag Filters have compiled an impressive 20-year record of trouble-free, cement plant service while collecting product fines from rotary mills. Each filter has handled 1,000,000 cubic feet of air per hour for only 4½¢ in maintenance parts.

Allentown Portland Cement Co. finds Dracco filters cost less to maintain

Maintenance economy is an important advantage of Dracco Dust Filters. Cost records on many installations prove that Dracco systems last longer with less servicing.

A typical example is the three Dracco Multi-Bag Filters installed 20 years ago at the Allentown Portland Cement Co., Evansville, Pa. to recover product fines from clinker grinding operations. Total replacement parts including filter bags during this period have been $5,425—an annual cost of only $90 per filter! Operated continuously, the filters today are in excellent condition with many years of service remaining.

Outstanding maintenance records like this result from Dracco units which are engineered for easy, low-cost inspection, repair and parts replacement. Dracco's simplified design uses a minimum number of easily accessible moving parts. Filter bags can be quickly changed on the clean-air side. Extra-heavy construction assures a long, dependable service life with minimum downtime.

Maintenance cost-savings are another reason why it makes sense to specify Dracco Dust Control Equipment—there's a unit to solve almost every industrial dust or fume problem. Experienced Dracco engineers will be glad to supply further information or technical assistance.

DRACCO CORPORATION

4060 East 116th Street · Cleveland 5, Ohio

Complete 40-page catalog on Dracco Dust Control Equipment contains detailed data and valuable reference material. Write for Bulletin 800.

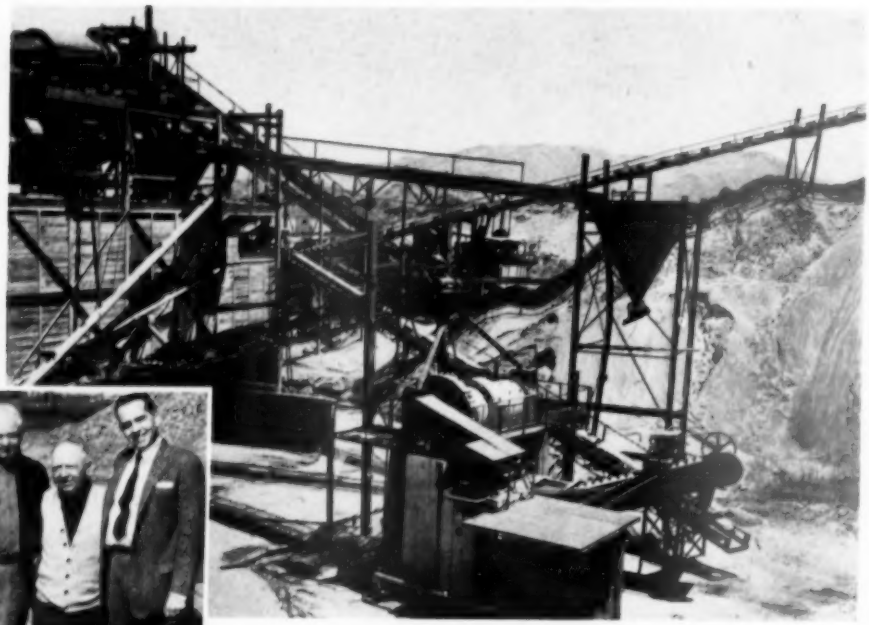
DRACCO *airstream* conveyors
dust control equipment

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see what Marcy can do for YOU!

Marcy Mill, Grinding Excess Material, Enables Petrillo Bros. to Meet Rigid Sand Specifications.





5' x 10' Marcy Center Peripheral Discharge Rod Mill at Petrillo Bros., Inc., plant, Wilmington, Delaware. This installation was engineered by the A. R. Amos Co., Philadelphia, specialists in sand and gravel plants. Shown in small photograph are, left to right: Charles Petrillo, Sec.-Treas.; Louis Carbone, Supt.; and M. B. Hawes, A. R. Amos Co.

In 1955 Petrillo Bros. found that their natural sand was deficient in fines and did not meet the rigid state specifications. To solve this problem the A. R. Amos Co. and Mine and Smelter were called in for consultation. Experience in dealing with this type of problem resulted in recommending installation of a 5' x 10' Marcy Center Peripheral Discharge Rod Mill. This mill was to produce approximately 95% — 10 mesh material from ½ x 3/16 round gravel, which was excess material. The discharge from the Marcy Mill was to be blended with natural material and fines from other crushing operations.

No Replacement Parts Required in Two Years

This Marcy CPD Mill has been in operation approximately two years and has enabled Petrillo Bros. to successfully and economically meet the rigid sand specifications. No replacement parts have been required. The only Marcy Mill operating costs, to date, are for the addition of approximately 2½ grinding rods per week; power, which is low; daily inspection and lubrication.

This is typical of problems solved by *Marcy experience*... may we help you with yours.

NO EXTRA CHARGE FOR MARCY EXPERIENCE

THE MINE AND SMELTER SUPPLY CO.

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New dam gobbles sand

continued from page 146

tons per hour from a liquid cyclone. Under the eight-spigot water scalper tank are a 36-in. single screw and a 36-in. double screw for dewatering the two combined sizes of sand. The coarser sand from the dewatering screw and the fine sand from the double screw are sent to separate 50-ton blending bins. Air-operated 12 x 24-in. gates and electric vibrating feeders control the outlet from these two bins for proportional blending.

The overflow from the two banks of dewatering spirals flows to a small steel tank. Fine sand that might otherwise be lost settles in the tank and is picked up by a 2-in. sand pump which delivers it to a 12-in. company-made liquid cyclone. About two tons of recovered sand per hour is sent to the fine sand blending bin.

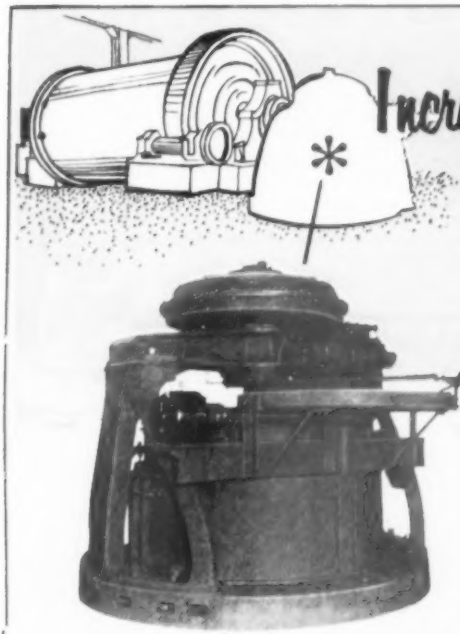
Under the water scalper, the waste launder carries off a considerable amount of the 30 to 50-mesh sand that settles in the scalper via a 4-in. sand pump. Water for the operation comes from three pumps at the river.

Most of the material for construction, including the portland cement, comes in by rail. Merritt-Chapman & Scott have built a temporary bridge across the Columbia river that connects with a spur of the Milwaukee Road serving the general area. Locally produced pozzolan, mined across the river from construction headquarters, is used in the concrete. One bag is used with each three bags of portland cement to bring up the strengths to specifications.

END

PRIEST RAPIDS DAM EQUIPMENT REFERENCE

Shovel, 3½ cu. yd.	Marion Power Shovel Co.
Bottom dump truck, 25 cu. yd. (14)	Euclid Div., General Motors Corp.
Apron feeder, 42 in. x 14 ft.	Iowa Mfg. Co.
Vibrating grizzly, 50 in. x 8 ft.	Nordberg Mfg. Co.
Primary jaw crusher, 22 x 36 in.	Iowa Mfg. Co.
Feeder under surge pile	Syntron Co.
Triple-deck screen, 5 x 14 ft., (2)	Allis-Chalmers Mfg. Co.
Double-deck screen, 5 x 12 ft.	Allis-Chalmers Mfg. Co.
Cone crusher, 3-ft. standard	Nordberg Mfg. Co.
Cone crusher, 4-ft. short head	Nordberg Mfg. Co.
Water scalper tank, 28-ft., 8 spigot	Eagle Iron Works
Dewatering spiral, 36 in. x 25-ft. single screw	Eagle Iron Works
Dewatering spiral, 36 in. x 25-ft. double screw	Eagle Iron Works
Sand pump, 2 in.	Western Machinery Co.
Sand pump, 4 in.	Western Machinery Co.
Conveyor belts	Quaker Div., H. K. Porter Co.
Gates (7)	Syntron Co.
Weigh batcher	C. S. Johnson Co.
Mixers, 4 cu. yd. (4)	Koehring Co.



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Meet Clarence Eddy

continued from page 154

was being precipitated in the clay, coal and coke mixture fed to the sintering hearth. The dust, whirling at high speed by vacuum into the dust collector, built up a corrosive sulphuric acid paste which would eat out 8-in. steel plates in an average of two years.

Here, the solution which Mr. Eddy developed after testing sulphuric acid reaction on various metals was probably one of the prettiest bits of steel work in any lightweight aggregate plant. This consisted of lining the dust collector throughout with 4 x 10-ft. stainless steel plates, at a cost of $700. The plates, neatly welded by Mrs. Eddy, a licensed master welder, have proven completely corrosion-resistant over the past two years and while they were substantially more expensive than the original steel plate installation, the difference in longevity will ultimately reduce dust collector maintenance cost to around 25 percent of the former amount.

Among his accomplishments in the ceaseless quest for better operation at less cost, Mr. Eddy has built his own suction and circulating fans, at something like 50 percent of the ready-built price, while increasing both vacuum and air pressures by 10 to 20 percent and switched from gear trains to electrical power supply systems. Now one of the most efficient plants in the nation, the Colorado Cinder Concrete Products Co. plant has passed along all of these improvements to a sister plant at Kansas City, Kansas.

END

From blast furnace slag

continued from page 166

on the synthetic glassy slags satisfactorily agreed with the results related to the industrial granulated blast furnace slags.

When the clinker content of the cements was four or six percent, the surface hardening of the specimens was observed to be little different than the surface hardening of the specimens from the cements with two percent clinker content. The effect of the increase in the clinker content, however, was estimated to vary with the chemical compositions of the slags, and this effect appeared to become remarkable when the CaO content of the slags decreased.

References for Part III. The first section of references has been cited in Part I, which appeared in the March, 1957 issue of Rock Products.

(9) T. Tanaka, Reports of the Committee for Slags in Japan Cement Engineering Association, 0.2, p. 16 (1955).

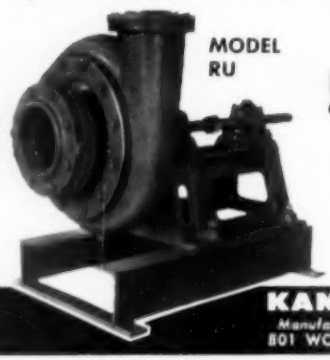
(10) J. D'Ans u. H. Eick, Zement-Kalk-Gips, 449-459 (1954).

(11) T. Tanaka, Reports of the Committee for Slags in Japan Cement Engineering Association, 0.3, p. 18-19 (1956).

END

For Handling Abrasive, Fine Mesh Solids at Minimum Cost!

- NO PERIODIC ADJUSTMENTS
- ONLY THREE WEARING PARTS
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- STAINLESS STEEL SHAFT



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RUBBER LINED PUMPS

OUTLAST METAL LININGS 5 TO 10 TIMES!

Ideal for handling silica sand, glass sand, coal silt, remnants from classifiers or any other abrasive slurry. The simple design of the pump and its long wearing construction assure long, trouble-free service life, high operating efficiency and a minimum of care. Available in 6" x 8" and 4" x 6" sizes.

A new bulletin completely describing this pump is available . . . write



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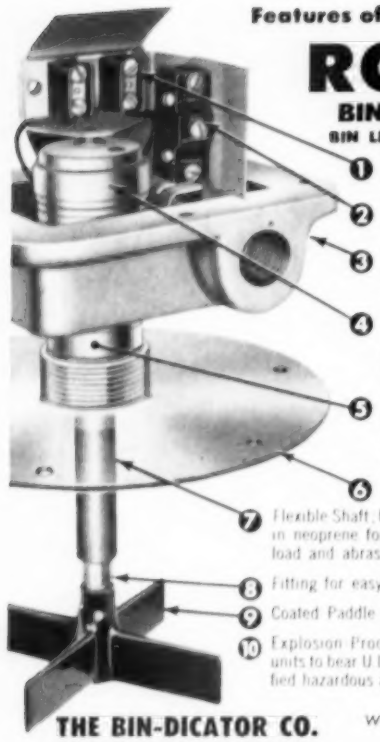


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Cable maintenance

continued from page 158

worn sheave bearings and results in rope vibration which causes steel fatigue and premature, unpredictable failure.

After installing a new cable, treat it as you would a piece of new equipment. Don't overstress it. Let it break in easy so that the individual wires and strands have an opportunity to stretch and position themselves in the sheaves and around the drum. Sudden starts or stops should be avoided, for jerking out slack can break even a new cable. "Bird caging" of the cable can result from sudden stops, and the sudden reduction of tension weakens wire rope rapidly.

Some owners have equipped their machinery with a small spare drum or reel at the "dead-end" of cable to provide a length of rope to replace a length cut off or broken at the working end. When wire rope wear occurs at the drum end, the "dead end" wedge can be removed and new cable pulled through the system far enough to eliminate the worn section. The worn cable, anchored to the cable control drum, can be cut off as necessary and the "dead end" wedge reinstalled. By cutting off 1 or 2 ft. of rope periodically, "fresh" cable is located at critical wear points, where bends occur and over sheaves. It is often economical to reverse the wire rope end for end when wear becomes apparent in the working end.

END

Booming market

continued from page 118

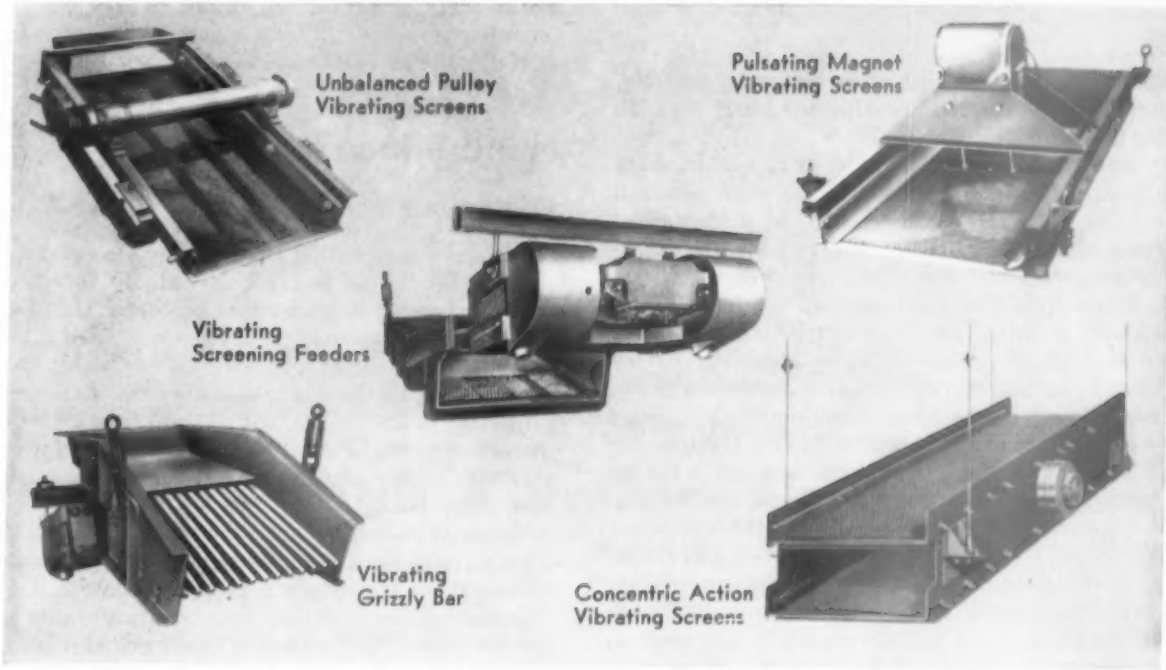
Capistrano Rock is building more field shipping bins.

Washed sand is also pile-drained before shipment. A clamshell crane reclaims sand from the conveyor discharge and piles it within reach of a field shipping bin. This bin has four bifurcated gates in the bottom to provide rapid loading of the tandem trucks common in the Los Angeles area.

Water from the stockpiles quickly permeates the topsoil and the underlying gravel to reach the water table. Waste water from the washers in the plant is piped to a series of settling ponds in the bottom of the gravel pit. Overflow eventually reaches the pond at the water table where a raft-mounted pump sends clear water back to the top of the washing plant.

END

Higher Tonnages . . . at Lower Cost



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For Every Screening Problem

EFFICIENT SIZING AND SEPARATING OF SAND, GRAVEL AND ROCK . . . . .

SYNTRON now offers a complete line of screening equipment to the non-metallic minerals industry. SYNTRON Vibrating Screens are designed and built for long dependable service and combine high capacity output with low operating and maintenance cost—plus quality control of material.

SYNTRON Vibrating Screens are backed by more than a quarter-century of experience in the materials handling field.

SYNTRON'S years of experience are available to you, send details of your screening problem to our application engineers for recommendation.

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VIBRATORY FEEDERS



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SYNTRON COMPANY
450 Lexington Ave. Homer City, Penna.

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New quartzite markets

continued from page 142

monument and building stone industry, and Mr. Lundin is aggressively looking for other uses for his fine sizes of quartzite.

As customers' needs dictate, or as new markets appear, new equipment will be added. A new rail loading dock was built recently to permit more rapid loading of gondolas and to widen the marketing area which the quarry could serve.

Even with the most modern equipment and steadily growing demand, quartzite is still difficult to process, according to M. S. Manning, quarry superintendent. Abrasive wear is tremendous, and maintenance of equipment is continuous and costly —though not as great as originally budgeted.

The hammers of the impact crusher must be hard-faced after each shift. It takes almost as long for the maintenance welder to build them up again as it took to wear them down. Drill bits and crusher cones wear rapidly from continuous contact with the abrasive rock. Much of the actual work of the 11 men who operate the plant is inspection, maintenance and repair.

Inspection of the moving parts of machinery is made at every opportunity. Trucks, shovels, drills, compressors and other machinery are checked and inspected almost continuously.

However, in spite of marketing problems and maintenance problems, the future is very bright for widening demand and expanding operations at the New Ulm Red Stone Quarry.

END

Need a loan?

continued from page 160

important consideration. Security alone is not sufficient to convince a banking official. He does not want to become a used-business dealer nor lose money selling securities to cover a defaulted loan. You must outline the exact method by which you expect to repay the loan. Base it on an intelligent projection of the future, not on the vague hope of increased profits. Plan it so that it will not interfere with money needed to safely operate the business even during a recession.

Getting funds when you need them is as vital to a rock-products operator as to any of the nation's thousands of businessmen and industrialists. Use this method the next time your company wants to borrow money. The bankers who suggested it know that it will aid you in getting approval of your loan and in cutting short the waiting period.

END

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Asphalt Mixing Plants
Bagging Machines
Bags
Barges
Belting, Conveyor
Elevator, Power Transmission
Belting, V type
Belt Repair Equipment
Bin Level Indicators
Bins and Batching Equipment
Bits
Blasting Supplies
Bodies, Trailer
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Conveyors
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Fifth Wheel Heavy Duty Special
Flotation Equipment
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Gasoline Engines
Gear Reducers
Generator Sets
Grinding Media
Gypsum Plant Machinery
Hard Surfacing Materials
Hoists
Hoppers
Kilns: Rotary, Shaft, Vertical
Locomotives
Lubricants
Magnetic Separators
Mills
Pipe
Pumps
Scales
Screen Cloth
Screens
Scrubbers: Crushed Stone, Gravel
Shovels, Power
Speed Reducers
Tanks, Storage
Tires and Tubes
Torque Convertors
Tractor Shovels
Tractors
Trailer Dump Bodies
Trucks, Bulk Cement
Trucks, Industrial
Trucks, Mixer Body
Trucks, Motor
Valves
Vibrators
Welding and Cutting Equipment
Winches
Wire Cloth
Wire Rope

If equipment you are in market for is not listed above, write it in space below.

The principal rock product(s) manufactured by my company is are indicated "1", "2", "3", in order of importance below

Crushed Stone
Sand & Gravel
Slag
Cement
Lime
Gypsum
Ready Mix Concrete
Concrete Products
Type
Other nonmetallic mineral (What?)

All above information is strictly confidential to be used to guide the manufacturers in supplying proper information.

Please Check Service Desired

Have Salesman Call
Prices
By mail
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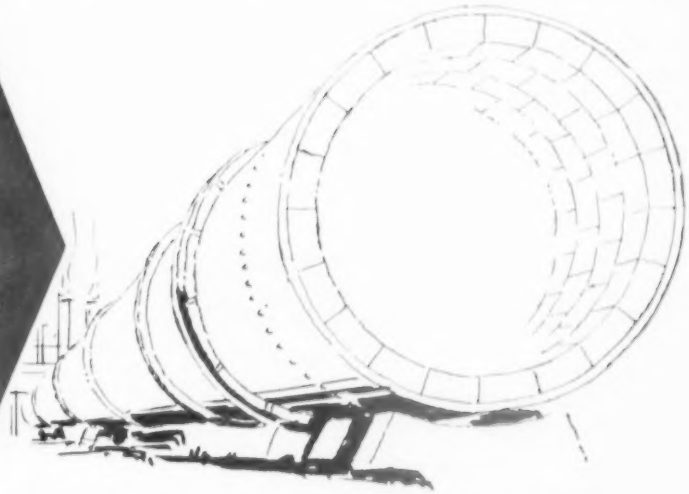
NOTE: See—Where to Buy-Classified Advertising Section for used equipment and complete plant information

Name
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Title

FILL IN—TEAR OUT—MAIL NOW! *BUYER RESEARCH SERVICE DEPARTMENT* ROCK PRODUCTS 79 W. Monroe St. Chicago 3, Illinois

Higher Bulk Density . . . Lower Porosity

the BIG PLUS in



WALSH High Alumina Refractories

Quality control, spearheaded by better research and ceramic engineering, has been largely responsible for the plus values in Walsh High Alumina Refractories for the cement and lime industries.

Their composition of carefully graded and selected minerals, noted for non-shrinking qualities, is further enhanced by the dry press method of manufacture, imparting uniformity of size and shape.

Lower porosity and higher bulk density characteristics account for their increased tensile strength, consequent greater resistance to abrasion, and excellent non-spalling qualities—features that combine to insure better all 'round performance throughout a longer service life at elevated temperatures. Isn't this the kind of performance you've been looking for in your plant? Get the whole money-saving story from your Walsh representative, or write us for details.

WALSH HI LUMITE

60 & 70, Dry Press Process Firebrick (60% & 70% alumina content, respectively).

Uses: High temperature liners for rotary cement kilns and lime kiln linings.

Properties: Non-shrinking; low porosity, higher tensile strength that reduces refractory loss incurred when coating peels off.



WALSH WARCO XXD

High Duty Firebrick, Dry Press Process.

Uses: Cold and hot zone rotary kiln liners and lime kiln linings.

Properties: Greater resistance to abrasive action; higher bulk density; mechanically stronger; clean cut corners and edges . . . true to dimension.



WALSH MULLITEX D

Super Duty Grade Firebrick, Dry Press Process.

Uses: Intermediate zone liners.

Properties: Higher bulk density and lower porosity in super duty grade . . . resistance to thermal shock; greater resistance to abrasion.



Specialists in refractories of high bulk density and low porosity

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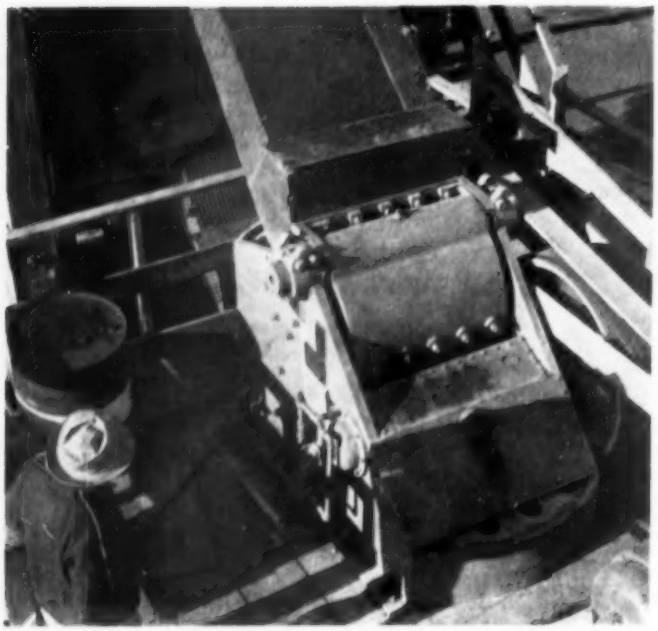
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5 TIMES LONGER JAW PLATE SERVICE IN CRUSHING EXTREMELY HARD GRAVEL

"crushing without rubbing" principle of KUE-KEN® CRUSHERS eliminates abrasion--the main cause of jaw plate wear



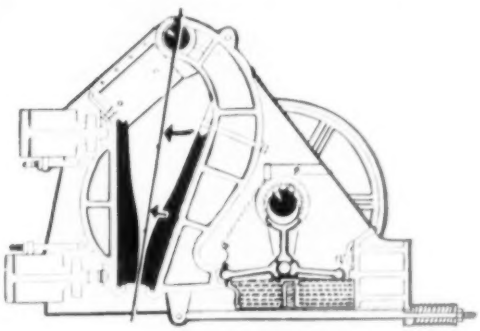
36"x10" Kue-Ken crushing extremely hard gravel. This operator installed a duplicate Kue-Ken in another plant.

Kue-Ken crusher size	¾"	1"	1¼"	1½"	2"	2½"	3"	3½"	4"	5"	6"	Horsepower range
24" x 12"	22	26	32	36	43	50	56					15 to 30
30" x 12"	32	35	38	42	55	70	76	85	110			20 to 30
36" x 10"	38	47	57	67	80	91	105					25 to 40
36" x 20"					70	82	90	115	135	160		30 to 50
42" x 25"					90	120	150	165	180	215	250	40 to 60

Table of tons per hour that will pass through crusher with jaws set at dimension shown when measured in the closed position.

Table is based on crushing average hard, dry quartz or similar rock weighing at least 100 lbs. per cubic foot when crushed.

Kue-Ken eliminates a major expense in jaw crusher operation . . . frequent jaw plate replacements. Unlike all conventional crushers, where some of the jaw plate is rubbed away with every crushing stroke Kue-Ken crushes without rubbing by gripping the rock squarely and crushing without upward or downward action. Jaw plates last at least 5 times longer saving replacement cost and frequent production losses from downtime. Also, Kue-Ken is the only crusher that eliminates shutdowns caused by rapid wear through dirt and grit in the operating mechanism. It has a crankcase-type lubrication system with all mechanism operating in a sealed bath of clean, filtered oil. Overload cannot damage Kue-Ken . . . safety device instantly releases flywheel. Automatic pressure switch sounds alarm or stops motor.



Jaw plates last at least 5 times longer . . . only Kue-Ken crushes without rubbing.

See how the hinge pin is located on the center line of the crushing zone. The jaw moves in an almost straight line. Rock is instantly gripped and crushed without rubbing.

KUE-KEN® CRUSHERS

"CRUSHING WITHOUT RUBBING"

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CASPER, WYO.	Moss Equipment & Supply Co.
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Pennsylvania Crusher Division, Exclusive Licensed Eastern Manufacturer and Distributor, 323 S. Matlack St., West Chester, Penn.

Armstrong Whitworth (Metal Industries) Ltd., Authorized Licensed Manufacturer and Distributor. Close Works, Gateshead-upon-Tyne 8, England

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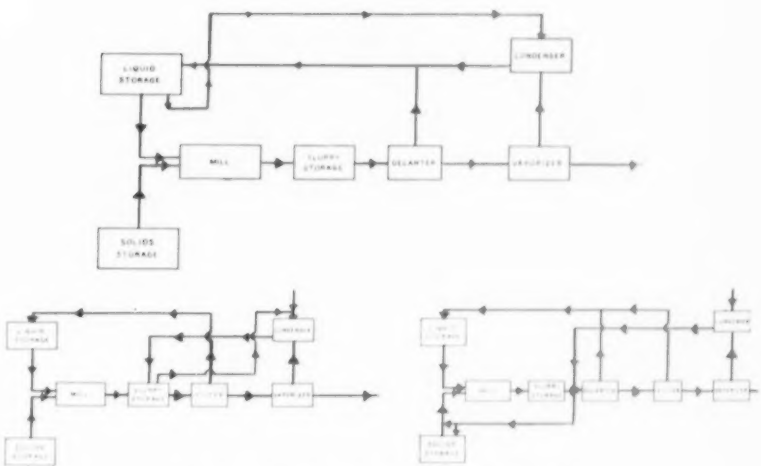
NEW U.S. PATENTS

OLIVER S. NORTH

Recently issued patents on nonmetallic minerals*

Cement

2,801,932—Processes for wet grinding **portland cement** raw materials whereby most of the nonaqueous liquid grinding medium is recovered for re-use. This invention improves on a method described by the same patentee in U. S. Patent No. 2,611,714, and has to do primarily with recovery of the liquid, which may be, for example, a liquid hydrocarbon such as fuel oil. The raw solids or the raw liquid, or both, can be utilized to effect condensation of vapors volatilized from the slurry. When any of the methods here disclosed are used, the initial cost of the equipment as well as the costs of maintenance and operation are substantially reduced, as compared with costs when conventional vapor condensation apparatus and methods are used. (to J. C. Witt)



Diagrammatic flow sheets for Patent 2,801,932

The three diagrammatic flow sheets (upper right) show various systems for accomplishing low-cost condensation of the liquid grinding medium. Direction of flow is indicated by arrows. Standard and well known pieces of equipment are used.

Figure 1 shows the circuit employed when portions of the raw grinding liquid are utilized for condensing purposes. In this example, the bulk of the liquid is decanted prior to admitting the partly dried slurry to the vaporizer. Vapors from the vaporizer are bubbled through raw liquid in the condenser, and the liquid returned to liquid storage for re-use.

Figure 2 shows arrangement of apparatus when dry ground solids alone, or a mixture of such ground solids and portions of the liquid, are used for condensing purposes. The ground slurry is filtered, and the filter cake subjected to vaporization. The solids and the raw and/or recovered liquid from the condenser are sent to slurry storage ahead of the filter.

Figure 3 shows arrangement of apparatus when raw unground solids are used for condensing purposes. Liquid from both the decanter and filter are returned to liquid storage. Unground solids, wetted with condensed liquid medium, are sent from the condenser to raw solids storage ahead of the grinding mill.

2,802,280 — Design for a heat-exchange apparatus of the multiple cyclone separator type for preheating mixtures of **portland cement** raw materials, using kiln gases. Cyclone separators are arranged in series and mounted one within another as a means of reducing heat loss and keeping the height of the installation at a minimum. (to K. J. Sylvest. Assigned to F. L. Smidth & Co.)

2,802,698 — Means for accurately controlling rate of flow of fluidized particulate solids, such as finished **portland cement** or portland cement raw materials, **lime, soda ash** and the like, from bins to other apparatus, such as kilns, bagging machines, etc. (to W. Krauss. Assigned to Fuller Co.)

2,802,732 — Metalized slag bodies for feeding into furnaces are prepared by bonding stainless steel grinding detrital material with **portland cement** and water. Bricks are shaped, dried and fired to incipient fusion before being added to the electric furnace melt. (to F. J. Crolius)

Gypsum

2,802,583—Design for a roller conveyor structure particularly adapted for loading into and unloading from boxcars bound bundles of **gypsum** wallboard. The operation is simple, rapid and does not require palletization of bundles (to F. C. Dansereau. Assigned to National Gypsum Co.)

2,802,747—Method for inhibiting reaction between **gypsum** plaster molds or parts of molds and the readily oxidizable molten metal coming in contact therewith during casting operations. A small amount of a polychlorinated benzene, polyphenyl or condensed ring aromatic hydrocarbon is added to the plaster. (to E. F. Fischer. Assigned to Aluminum Company of America.)

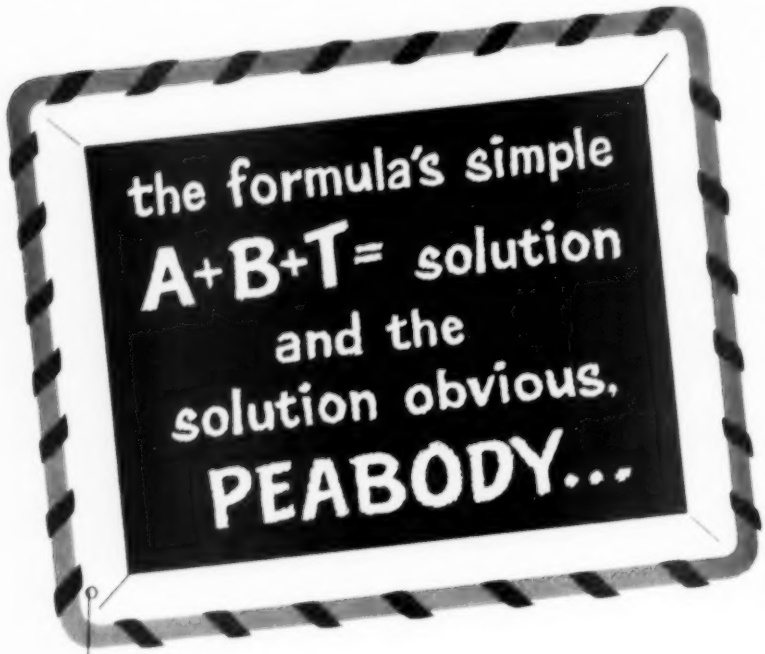
Vermiculite

2,802,306—In a method for increasing the earliness and degree of flowering of plants, the seeds are soaked in an auxin solution for 24 hours and then bedded in moist exfoliated **vermiculite.** The bed is kept at relatively low temperature, not exceeding 10 deg. C, for from 5 to 25 days, after which the seeds are transplanted to the greenhouse bed. (to A. C. Leopold and F. S. Guernsey. Assigned to Research Corp.)

(Continued on following page)

*Copies of United States patents are available at a cost of 25 cents each from The Commissioner of Patents, Washington 25, D.C. For convenience, coupons, each good for one copy of any patent, may be purchased from that official at the rate of $5.00 per 20-coupon pad or $25.00 per 100-coupon pad.

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NEW U. S. PATENTS

(Continued from preceding page)

Phosphate Rock

2,800,396 — Improved process for electric furnace production of phosphorous from **phosphate rock.** (to M. J. Udy. Assigned to Strategic-Udy Metallurgical & Chemical Processes Ltd.)

2,801,004—A method for producing from black liquor soap skimmings a reagent that may be used directly in the recovery of phosphate values from **phosphate rock,** either by the froth flotation or agglomeration process. The skimmings are mixed with an equal amount of water and treated with NaOH to bring the pH to about 11. (to W. A. Hodges and J. E. Floyd. Assigned to Swift & Co.)

2,802,728 — Process for producing superphosphate from **phosphate rock.** A suitable organic wetting agent is added to the sulfuric acid before the acid is mixed with ground phosphate rock. (to L. L. Jaquier, Jr. Assigned to Phillips Petroleum Co.)

Spodumene

2,801,153 — Improved method for recovering from **spodumene** pure lithium in the form of the carbonate or hydroxide. Ore is roasted by conventional means, and the beta-spodumene thus produced is roasted with dry ammonium sulfate to convert the lithium therein to the sulfate form. Then the roasted ore is leached with aqueous ammonia to dissolve lithium sulfate and ammonium sulfate therefrom, and lithium values are recovered from the leach liquor. Iron and aluminum are not dissolved from the ore, as is the case when spodumene ore is treated with sulfuric acid. (to T. E. Dwyer. Assigned to Tholand, Inc.)

Mineral Wool

2,801,427—A fireproof bed pad is made by disposing sheets of **mineral wool** between layers of metallic foil, such as aluminum foil, and covering the whole with an ornamental outer covering. (to W. E. Crocker. One-third assigned to Ben Gustan)

Trona

2,798,790 — Process for producing pure crystallized sodium sesquicarbonate from Wyoming **trona.** An excess amount of normal carbonate is provided by mixing with the hot trona solution a slurry containing sodium chloride and excess carbonate. (to R. D. Pike.)

(Continued on page 206)

Raymond
ROLLER MILL
with Whizzer Separation and Flash Drying



Typical set-up of Roller Mill with piping, collectors, and package type furnace for supplying heat to system for Flash Drying.

DYNAMIC MODERN DESIGN of the Raymond Roller Mill gives you important new economies in production.

This complete pulverizing unit combines: Whizzer separation with simplified fineness control . . . . pneumatic feed control to maintain maximum mill capacity . . . self-lubricating roller journals for reducing lubrication costs . . . . throw-out attachments for rejecting impurities; also for making two grades simultaneously: granular product with a minimum of fines and the normal finely divided product from the cyclone collector.

The Mill serves a double purpose when built with integral Flash Drying accessories for removal of surface moisture while pulverizing. By the same system, fresh air may be introduced into the mill for cooling action . . or a neutral gas used with special equipment as in the grinding of sulphur.

The ease of installing the Roller Mill to fit an existing plant layout, its flexibility in application, its automatic dust-free operation with a record low cost of maintenance, make the Raymond Roller Mill a sound investment for modern plants.

Tell us your pulverizing requirements. Raymond engineers can determine what the Roller Mill can accomplish for you by running laboratory tests on your material. Catalog will be sent on request.



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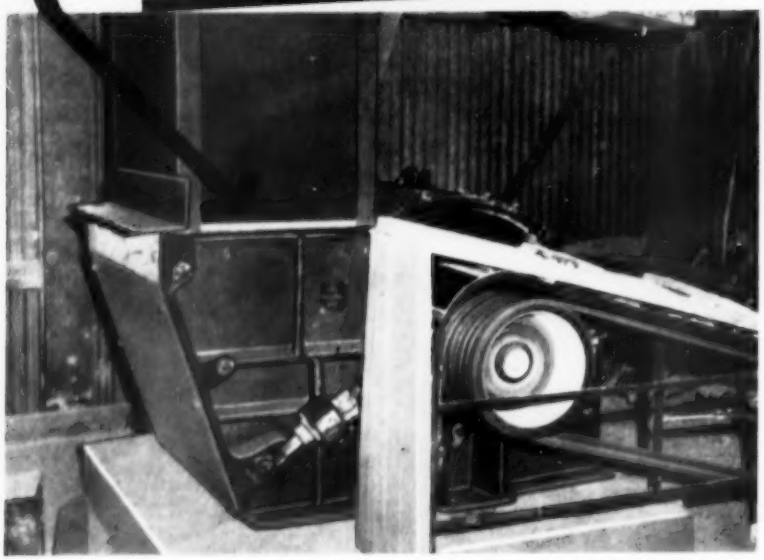
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American PULVERIZER COMPANY
ORIGINATORS AND MANUFACTURERS OF RING CRUSHERS AND PULVERIZERS
1245 MACKLIND SAINT LOUIS 10, MISSOURI

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NEW U. S. PATENTS

(Continued from page 204)

Dolomite

2,801,155 — Process for producing magnesium hydroxide and recoverable nitrogenous compounds from dolomite. The **dolomite** is dissolved in nitric acid. (to O. Kippe. One-half assigned to Paul O. Tobeler, doing business as Trans Oceanic.)

2,802,720—Continuous cyclic process for manufacturing pure magnesium carbonate and pure magnesium oxide from **dolomite** or other materials containing magnesium. (to R. A. Opatowski)

Sulfur

2,801,090 — Method for producing **sulfur** from salt dome deposits by electrolysis of the mineral formation. An electrode is placed in contact with either connate or supplied saline water as the electrolyte, and an electrical current passed through the electrode and electrolyte, causing the liquifiable sulfur to be rendered fluid and pumpable. This method does not require the usual large quantities of hot water. (to W. A. Hoyer and M. S. Taggart, Jr. Assigned to Esso Research & Engineering Co.)

Whiting

2,801,636—Finely pulverized **whiting** is used in a gelatinous wrapper preparation used instead of paper to hold together particulate or leaf tobacco products. (to C. Pfoh)

2,801,745—The life of a bag in which solid benzene hexachloride is packaged can be extended by incorporating into that material a small percentage of pulverized **whiting.** (to L. W. Piester. Assigned to Columbia-Southern Chemical Corp.)

Borax

2,800,454-2,800,455—An improved gel refrigerant material comprised of starch, paraformaldehyde, **borax** and water. Borax accelerates the set of the mixture, prevents breakdown of gel when unfrozen and refrozen and delays formation of slimy fluid as the gel warms. (to J. C. Shepherd)

Lime

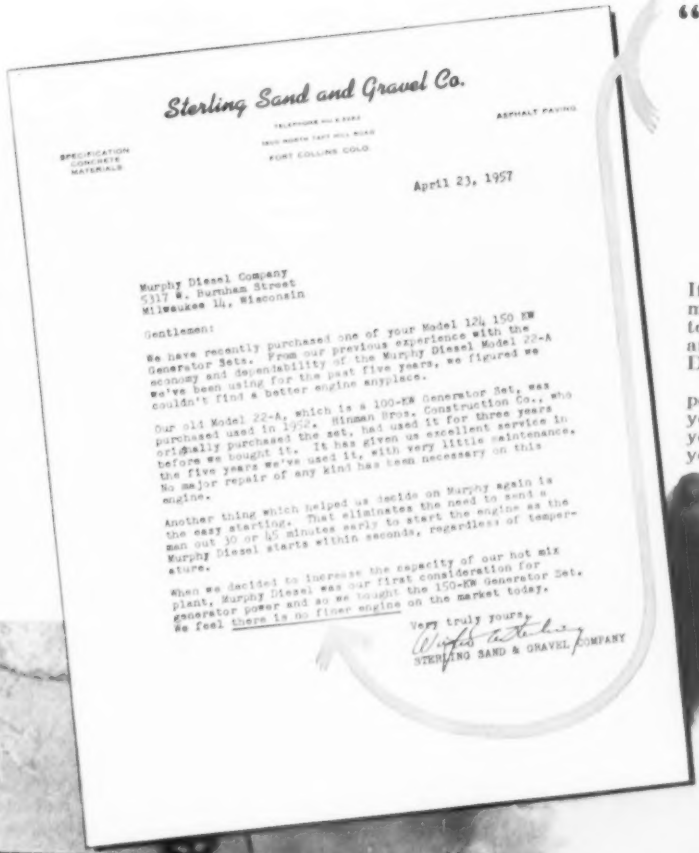
2,802,719—"Dry" process for preparing completely carbonated calcium carbonate, or **whiting,** from **lime** or hydrated lime. The material is suspended, heated and moistened, and the water vaporized to steam. The cloud of lime particles then is treated with gaseous carbon dioxide. (to S. Z. Avedikian)

(Continued on page 208)

"There is no finer engine than MURPHY DIESEL"

If you're looking for dependable power with maximum operating economy, it will pay you to profit by the experience of so many other pit and quarry operators who have found Murphy Diesel to be "the finest engine on the market."

Talk over your requirements for engines, power units or "packaged" generator sets with your Murphy Diesel Dealer. Ask him to show you how trouble-free Murphy Diesels can help you increase profits.



Sterling Sand and Gravel Co.

SPECIFICATION CONCRETE MATERIALS — ASPHALT PAVING

FORT COLLINS COLO.

April 23, 1957

Murphy Diesel Company
5317 W. Burnham Street
Milwaukee 14, Wisconsin

Gentlemen:

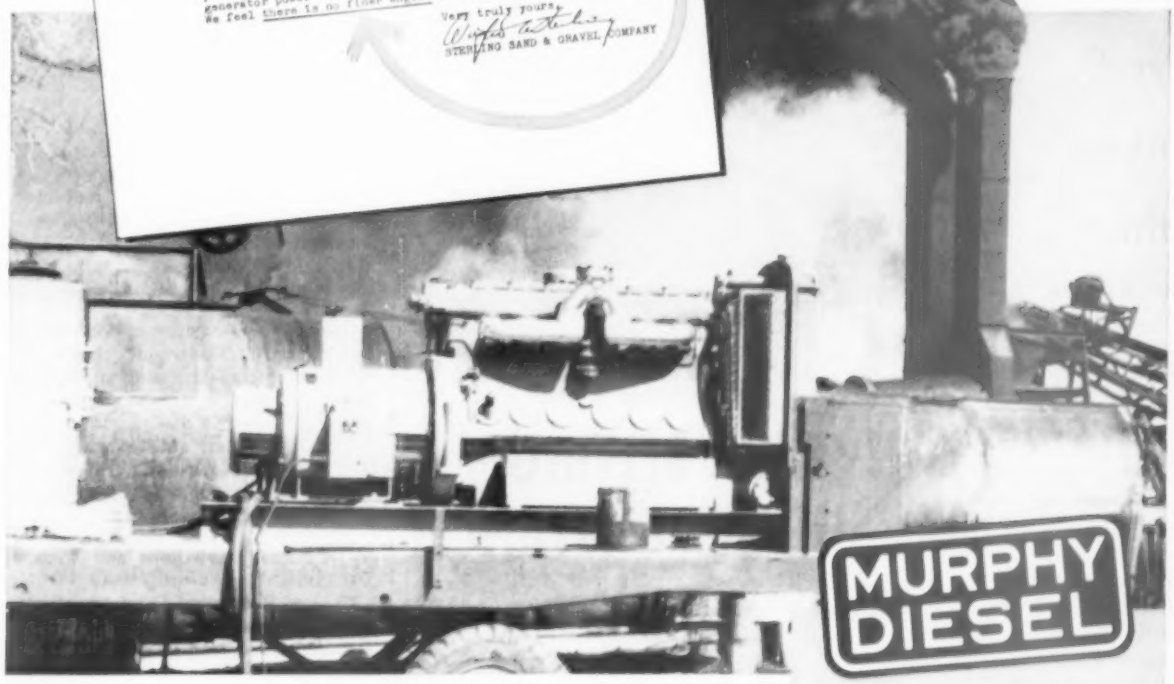
We have recently purchased one of your Model 124 150 KW Generator Sets. From our previous experience with the economy and dependability of the Murphy Diesel Model 22-A we've been using for the past five years, we figured we couldn't find a better engine anyplace.

Our old Model 22-A, which is a 100-KW Generator Set, was purchased used in 1952. Hinman Bros. Construction Co., who originally purchased the set, had used it for three years before we bought it. It has given us excellent service in the five years we've used it, with very little maintenance. No major repair of any kind has been necessary on this engine.

Another thing which helped us decide on Murphy again is the easy starting. That eliminates the need to send a man out 30 or 40 minutes early to start the engine as the Murphy Diesel starts within seconds, regardless of temperature.

When we decided to increase the capacity of our hot mix plant, Murphy Diesel was our first consideration for generator power and so we bought the 150-KW Generator Set. We feel there is no finer engine on the market today.

Very truly yours,
STERLING SAND & GRAVEL COMPANY



MURPHY DIESEL COMPANY

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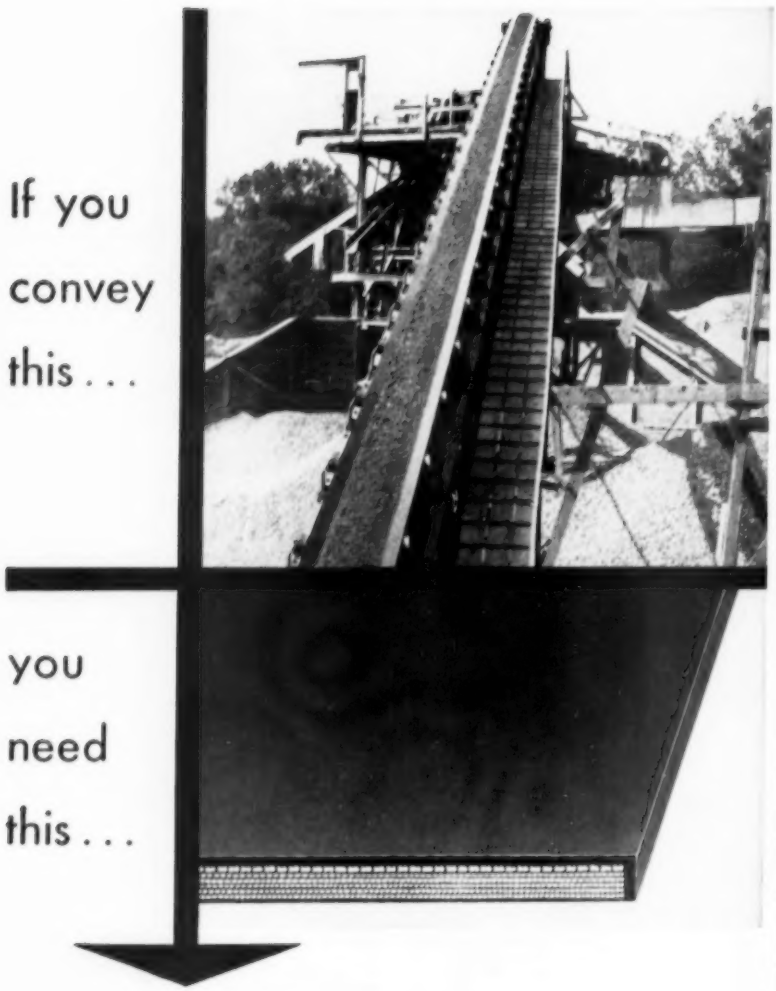
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QUAKER RUBBER DIVISION

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NEW U. S. PATENTS

(Continued from page 206)

Miscellaneous

2,796,843—Improved backing rings for the welding of ends of pipe sections are made of porous, shatterable, easily machined ceramic compositions. Various formulae cited show mixtures that include **ball clay, kaolin, talc, feldspar, kyanite, mullite** and glass bonded **mica** and **asbestos.** (to W. D. Kleppinger. Assigned to Steatite Research Corp.)

2,796,946—A tile or panel especially adapted to sound absorption and heat insulation is based on a clay gel or dispersion made with sodium **bentonite** and water. To the gel is added ground cardboard, **mineral wool** fiber, or the like. **Portland cement** is admixed, and finally calcined **gypsum** is spun into the material, which then is ready to be cast in open molds or injected into closed molds. When sufficiently set, the units are removed from molds and air or kiln dried. (to W. Kulmann. Assigned to Industrial Research Laboratories, Inc.)

2,797,175—In manufacture of high voltage electrical insulators, a glaze composition comprising proportioned amounts of **flint, feldspar, ball clay** and **whiting** is applied to a semiconducting coating of the oxides of iron, chromium and titanium. (to P. B. Horton. Assigned to General Electric Co.)

2,797,985—A synthetic soil ideally constituted physically and chemically for plant growth is made by mixing pulverized **granite, limestone, clay** and **gypsum** with the organic materials peat, horse manure and sewage sludge. The mass is allowed to ferment and then aerated and agitated until decomposed. (to J. D. Larson.)

2,799,489—Apparatus and method for preheating **dolomite, magnesite, chalk, portland cement** raw materials, etc. Means are provided for heating material slowly and uniformly, and in such manner as to realize maximum utilization of heat, for example, gases from a primary kiln. (to H. Rusche.)

2,800,415—Method of manufacturing an "85 percent magnesia" material having high water repellency. An aqueous slurry of carbonated magnesia, **asbestos** and asphalt is molded, and the shapes are dried of free moisture and baked at optimum temperature. A small amount of **bentonite** may be added to disperse the asphalt and maintain the suspension. (to W. R. Seipt. Assigned to Keasbey & Mattison Co.)

END

For Dust Collection...

Western Precipitation
presents
its latest development
in a quarter-century of
continuous advancement
in Mechanical Collectors

...The "9VGR" MULTICLONE!



Over 25 years ago

Western Precipitation Corporation pioneered the high-efficiency multiple-tube principle that has proven so superior it is now the pattern for the industry.

The Multiclone continues to be years *ahead* of all other centrifugal collectors because it incorporates the invaluable "know-how" gained through these many years of leadership in the field —leadership that is further emphasized by introduction of the 9VGR Multiclone, another important milestone in Multiclone's quarter-century of outstanding performance.

COTTRELL Electrical Precipitators
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NEW 9VGR FEATURES...

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2. *Easier and less costly to insulate.*
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Plus **The proven superiority of CAST IRON TUBES and VANES!**

Through the years, others have tried special alloy steels and so-called "miracle" metals, but nothing has proven as satisfactory *in actual field service* as cast iron. In the past quarter-century more than 270,000 Multiclone tubes have been placed in service with less than 1.85% replacement—*a performance record unequalled in the industry!*

There are many other advantages built into the 9VGR. There is a Multiclone representative near you who will be glad to supply complete details. Or write direct, asking for your free copy of Bulletin #M209 which contains full details.

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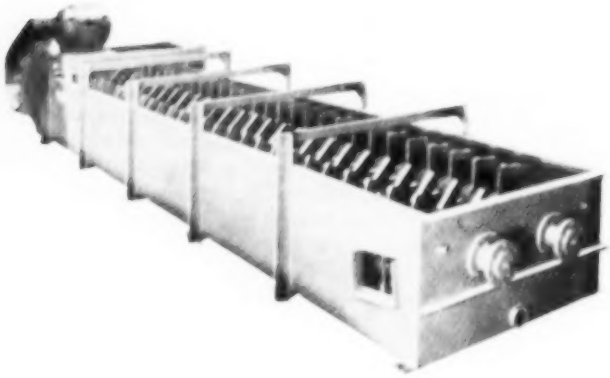
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4 EAGLE LOG WASHERS



PROCESS CRUSHED ROCK AT BROOKSVILLE (FLA.) ROCK CO.



Eagle Log Washers need no pampering — they're plenty tough! Non-deflecting tubular steel log shaft; marine type, water-lubricated bottom end bearings; Timken bearings at upper end; sturdy steel paddles with renewable corrugated face Ni-Hard chromium-nickel alloy iron shoes; positive, oil-bath, gear drive; 36" and 48" log diameter; 20', 24' and 30' tub lengths. They more than pay their way every working day! Send for Catalog.

BROOKSVILLE ROCK CO., Brooksville, Fla., processes "mountains" of crushed rock with four Eagle 36" dia. x 30' Log Washers. Each pair of washers processes a different size gradation. Two washers are handling minus 2" from the primary crushers and two are handling minus 2" from the impact crusher, and an Eagle Coarse Material Washing-Dewatering Screw is handling minus 3/8" to 10 mesh crushed rock.

These Eagle Log Washers, respected by the industry, scrub and abrade Brooksville's crushed rock to definite cleanliness. They are pleased with the results and their customers like the product.

SINCE 1872

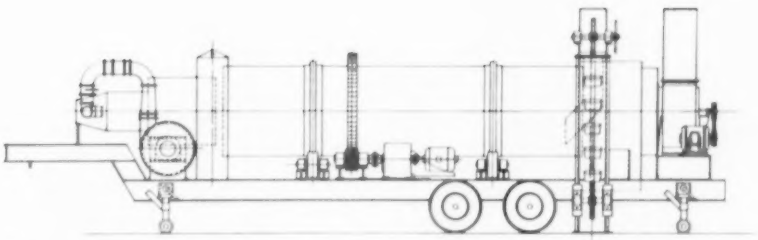
EAGLE IRON WORKS

Engineers • Manufacturers

137 HOLCOMB AVE., DES MOINES, IOWA

EIW

EAGLE IRON WORKS



Dryer unit has advantage of portability

THE MCCARTER IRON WORKS, INC., Norristown, Pa., has introduced the "Porto-Dry," an aggregate dryer unit. The complete installation includes dryer, dust collector, intake elevator, fan and stack.

Hourly capacity of the unit is 60 to 80 tons. The dryer, 5-ft. O.D. and 20 ft. long, rides on four cast steel machined trunnion rollers. The centrifugal type dry collector is mounted as an integral unit with dryer intake housing and is complete with collecting hopper.

Overall dimensions of the dryer, complete with running gear in travel position are: length, 40 ft. 2¼ in.; width, 8 ft.; height, 12 ft. 6 in. and weight, 35,000 lb.

Enter 307 on Reader Card

Vibration monitor system

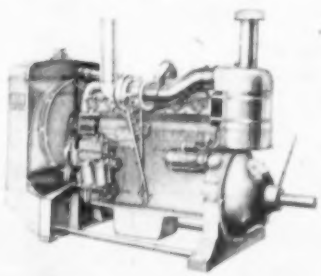


FIELDEN INSTRUMENT DIVISION, Robertshaw-Fulton Controls Co., 2920 N. Fourth St., Philadelphia 33, Pa., has developed a non-electric vibration monitor system to protect rotating and reciprocating equipment. The system combines the Robertshaw model 65 malfunction detector, for mounting on the protected equipment, and the new model 651 ac. control unit wired to the detector through ¾-in. conduit.

Applications include protection of pumps, motors, blowers, compressors, centrifuges, engines, turbines and other equipment. Model 65 malfunction detector is designed for use in Class I, Group D and Class II, Groups F and G locations. Model 651 control unit is available for operation with 115, 230 or 460-v. ac. control circuits. Models also are available for use in dc. circuits.

Enter 306 on Reader Card

Turbocharged power unit



INTERNATIONAL HARVESTER CO., Construction Equipment Division, 180 N. Michigan Ave., Chicago 1, Ill., has entered the turbocharged engine field with its new 250-hp. Turbotorque UDT-1091 power unit.

This 250 bhp. rating is attained at 1,500 rpm. The six-cylinder unit has the features of the naturally-aspirated UD-1091, plus advantages of turbocharger components. Its exhaust gas driven "AiResearch" turbocharger is said to move 60 percent more air through the 14-in. diam. air cleaner, cutting fuel consumption and increasing power with lower exhaust gas temperatures.

A water-cooled oil temperature stabilizer is standard equipment on the new unit, and the radiator has been enlarged to increase cooling capacity.

Enter 305 on Reader Card

Vacuum valve



DUSTEX CORP., 1758 Walden Ave., Buffalo 25, N.Y., announces a vacuum valve designed to provide an airtight seal for the discharge end of hoppers or bins, cyclones, or any type of dust collector operating under negative pressure. The seal is maintained by negative pressure within the valve which collapses the rubber sleeve. Weight of the collected material forces it through the sleeve at a constant flow. The rubber sleeve will withstand temperatures up to 350 deg. F. Special sleeves are available for collecting material at higher temperatures.

Standard units are constructed of carbon steel, and stainless steel valves also are available. All units can be bolted to a standard 8-in. flange.

Enter 312 on Reader Card

(Continued on following page)

NEW MACHINERY

(Continued from preceding page)



Self-propelled rotary drill

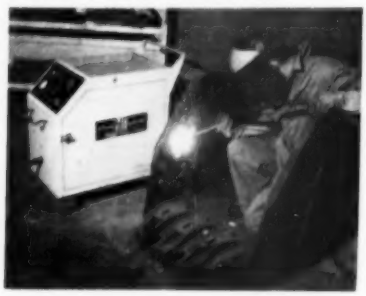
SCHRAMM, INC., 900 E. Virginia Ave., West Chester, Pa., has developed a rotary air drill mounted on a self-propelled air compressor for use in blast hole drilling, seismic and exploratory drilling and for surface operations in underground mining. Known as the Pneumatractor Rotadrill, this unit was designed for maneuverability, as it can move rapidly and work in tight places.

Rotary air drilling is accomplished through a reversible hydraulic motor-driven head, mounted on a carriage that rides tracks on the mast. This hydraulic drive eliminates the rotary table and Kelly bar. Holes can be drilled to 500 ft. with 2⅞ in. OD flush drill pipe.

The Pneumatractor supplies compressed air at the rate of 150 cfm. at the drilling pressure of 10 psi. However, air pressure can be boosted to 125 psi.

Enter 300 on Reader Card

Tubular wire electrodes



AMERICAN MANGANESE STEEL DIVISION, American Brake Shoe Co., 388 E. 14th St., Chicago Heights, Ill., has introduced tubular wire electrodes for open arc semi-automatic welding with its Amsco MF welder. Weld metal is said to be deposited up to 200 percent faster with these electrodes. The illustration shows a hardfacing operation being performed on the inside of a bucket.

The new tubular electrodes are 3/32 in. diam. with flux and hardfacing alloy, proportioned for the proper weld deposit held within the drawn steel tube. Amsco offers two types of tube wire: S/A manganese wire coils, for manganese steel buildup and repair applications, and S/A 53 for hardfacing to resist both wear and impact. The latter can be laid down at 150 to 350 amperes, ac. or dc., reverse polarity. It can be deposited at the rate of 5 to 15 lb. per hour, depending on the current, on weldable carbon steels or on manganese steel.

Enter 302 on Reader Card

Diaphragm pump



DENVER EQUIPMENT CO., P. O. Box 5268, Denver 17, Colo., announces production of a 4-in. adjustable-stroke diaphragm pump designed to make possible a longer stroke and up to 75 percent higher capacity. Factors said to contribute to increased life of the molded rubber-nylon cord diaphragm are (1) the curved design, which distributes flexing over its entire surface; and (2) its clamping in place evenly by the molded rim that distributes tension to the entire circumference.

Enter 303 on Reader Card

Troughing idlers

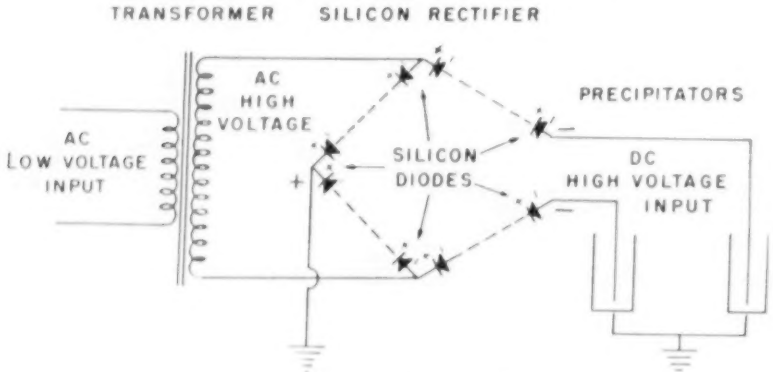
THE FAIRFIELD ENGINEERING CO., Marion, Ohio, has announced a new line of 4 and 5-in. troughing idlers in 18, 24 and 30-in. lengths, equipped with ball or roller bearings. A line of return idlers, also on anti-friction bearings, is being made available simultaneously through the company's distributor organization.

The troughing idlers are mounted on self-cleaning frames. The bearings are fitted for pressure lubrication and have labyrinth seals against dirt.

Enter 304 on Reader Card

(Continued on page 214)

Silicon rectifiers for electrostatic precipitators

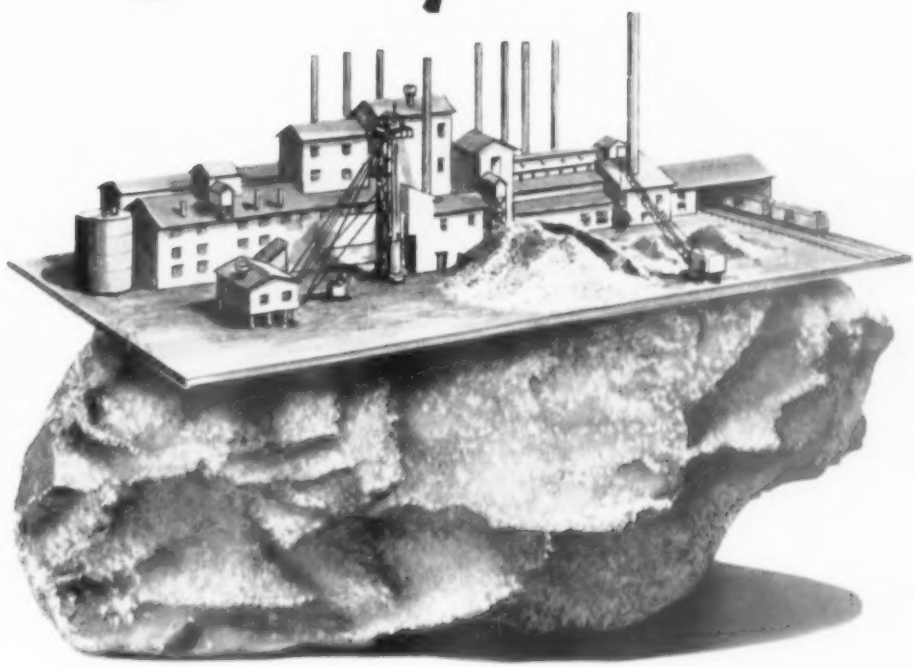


RESEARCH-COTTRELL, INC., Bound Brook, N.J., is making available a new oil-immersed silicon rectifier set. Units presently available are designed for application on new electrostatic precipitator installations. Modified designs to replace mechanical rectifiers are being prepared for combination with the transformers presently installed with these units.

Basic components of precipitator electrical equipment are the control unit, power transformer, and the rectifier for changing the high voltage ac. transformer output to the dc. used in the precipitator. The silicon rectifier consists of a number of minute silicon cells connected in series on a frame immersed in oil with the transformer. (See schematic diagram.) Units are available with rated output 70 kv. peak and 500 ma.

Enter 301 on Reader Card

Sitting Pretty!

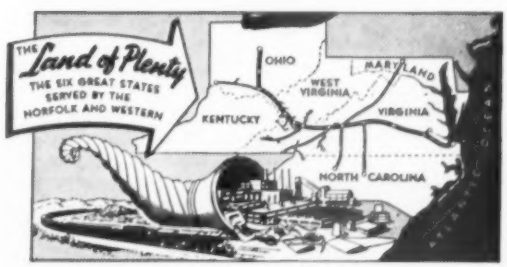


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NEW MACHINERY

(Continued from page 212)

Dust filter improvements

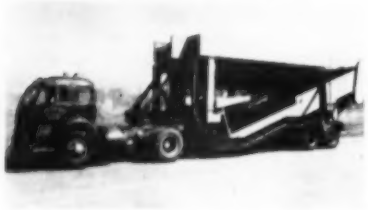
THE DAY CO., 810 Third Ave. N.E., Minneapolis 13, Minn., has announced several design improvements in the Day "AC" dust filter. The improvements are intended to speed field assembly and installation of the filters, ranging in air handling capacity from 500 to 25,000 cfm.

The "AC" filter is now furnished with both the drive and discharge ends of the filter preassembled and welded before shipment. This completely encloses both ends except for two 18 x 18-in. inspection doors at the top and bottom of the cleaning ring drive shaft assembly. The cleaning ring drive shaft is now mounted on a spring loaded, adjustable cast iron bracket. The drive chain has constant tension with a tension adjustment.

Another improvement has been made in the drive shafts, sprockets and bearings. Those are now also assembled and aligned before shipment. All bearings on new models are the permanently lubricated type.

Enter 308 on Reader Card

Portable washer-classifier



EAGLE IRON WORKS, 137 Holcomb Avenue, Des Moines, Iowa, announces that complete sand washing-classifying-dehydrating sections on wheels, for mobility, are now available.

The new units consist of a standard water scalping-classifying tank with automatic bleeder valves and three-cell collecting-blending flume, and two single-screw washer-classifier-dehydrators. Compactly mounted on a chassis, it is designed for use with semi-tractors. The unit can be hauled into the pit and positioned next to the crushing and screening plant.

Side flares on washers are removed, as shown, for travel. Manual control of metering "splitter" gates on tank in conjunction with three-cell flume adapts the unit to a variety of conditions. Both screws can be used to produce one product, or a different gradation can be produced with each screw. Capacities range up to 200 tph. of specification material.

Enter 309 on Reader Card





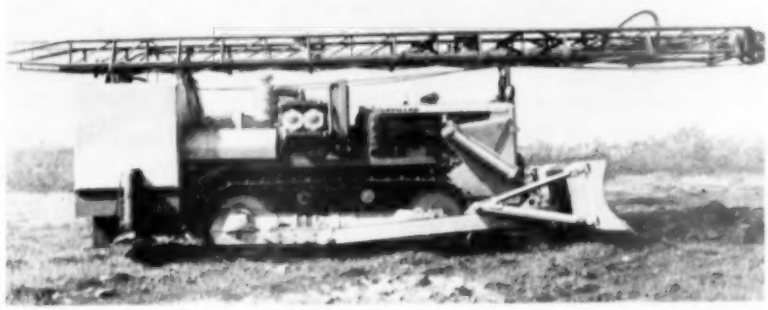
Rebuild kit puts a new chassis on an old truck

AUTOCAR DIVISION, The White Motor Co., Exton, Pa., is producing a new Autocar chassis rebuild kit consisting of current-model production parts. It can be used to rehabilitate any make of truck comparable to Autocar six-wheel diesel models DC 10264 and DC 10264 L (lightweight). All parts for a completely new Autocar chassis without power train are provided.

The kit is applicable for trucks in rugged, off-highway operations where the chassis frequently wears out before the power train. It is intended to overcome chassis obsolescence in such low-mileage operations as mining, quarrying and heavy construction.

Enter 310 on Reader Card

Tractor engine supplies power to drilling unit



DAVEY COMPRESSOR CO., Kent, Ohio, announces a tractor-mounted rotary air drill. Model M-8TA has been designed for extra-heavy jobs, having a rated capacity of 10-in. blast holes and 35,000 lb. pull down pressure.

The M-8TA uses compressed air for cleaning holes. It is said to attain normal drill bit speeds of 85-155-325 rpm. with three speed transmission. Air pressures of 10 to 125 psi. are available from a 6-cylinder 500 cfm. capacity compressor.

Originally designed for mounting on either a new or used Caterpillar D8, the drill can be adapted to other tractors of similar size. The tractor engine supplies power to the drilling unit through a chain and gear-type power transfer case.

Enter 311 on Reader Card

(Continued on page 216)

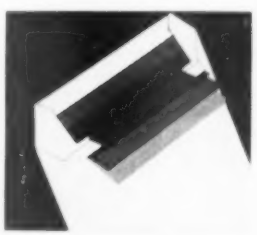


Since Edgar Hoppe, European Manager of St. Regis, invented the Stepped-End Bag, the U. S. cement industry has bought more than 200,000,000 of them from St. Regis. Here are two big reasons why.

BREAKAGE IS LESS: Bag breakage has been sharply reduced in the cement industry, where St. Regis Stepped-End Bags are used. Cement companies report in-plant breakage reduced by as much as 50%.

IMPROVED APPEARANCE, STACKING, HANDLING: Your product is often judged by its container. The square-shaped St. Regis bags look better . . . and the butt printing makes for easy identification of the product. Smooth ends makes for neater stacking and handling, too. Just ask the users—they're some of the leading cement manufacturers in the nation.

Always looking toward tomorrow, St. Regis is working constantly to improve the Stepped-End Bag. New developments, through testing and re-testing in laboratory and field, combine to bring you top performance at minimum cost. Find out for yourself how St. Regis Stepped-End Bags can become an important part of your packaging picture. Mail the coupon today.



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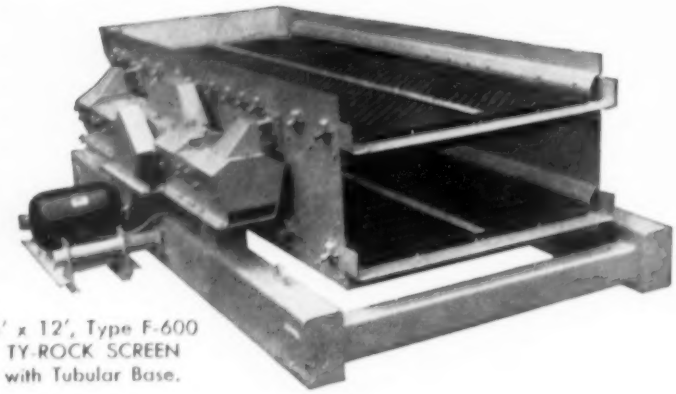
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5' x 12', Type F-600 TY-ROCK SCREEN with Tubular Base.

TYLER VIBRATING SCREENS AND TYLER WOVEN WIRE SCREENS

There is a Tyler Vibrating Screen for every sizing and dewatering job. Tyler Screens are noted for the huge tonnages handled with top efficiency and low cost per ton.

Tyler Woven Wire Screens are made in all meshes and metals in over 10,000 different specifications. Ton-Cap and Ty-Rod Screens with the long-slot openings provide the greatest capacity for a given discharge area.

THE W. S. TYLER COMPANY
CLEVELAND 14, OHIO
Manufacturers of Woven Wire Screens and Screening Machinery

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MORE TONNAGE with FORGED STEEL DROP BALLS

MORE PROFITABLE, EFFICIENT SECONDARY BREAKAGE.



2000 to 12000 lbs.

The "Cape Ann" Forged Steel Drop Ball is standard equipment in up-to-date quarries. It has a forged connecting link, protected by deep recess, adaptable for swivel or shackle. Strong alloy steel pin. Low cable replacements. Furnished complete as shown.

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NEW MACHINERY

(Continued from page 214)

Power hydraulic drive



LIPPMANN ENGINEERING WORKS, INC., 4603 W. Mitchell St., Milwaukee 14, Wis., offers an optional power hydraulic drive system for its portable crushing and conveying units. The method of driving is said to lessen vibration, noise and maintenance and to improve power transmission.

The drive works by oil pumped through flexible pipelines from a reservoir tank to hydraulic motors mounted individually on various plant components. Return lines bring the oil back to the reservoir tank. Pressure is automatically regulated.

In the Lippmann "Comanche" dual crushing plant pictured here, all drives except the ones to the crushers are of the new design.

Enter 313 on Reader Card

Power digger



SHERMAN PRODUCTS, INC., Royal Oak, Michigan, has brought out a new power digger, Model F, for mounting on Ford tractors. The model is equipped with a new, compact hydraulic system. Also contributing to increased power is the pump drive from the tractor PTO, at the rear, which develops digging speed through the Sherman planetary step-up transmission.

The shovel is tapered to prevent binding, and a two-position linkage permits quick adjustment. Shovel sizes available are 12, 18, 24, 30 and 36-in., with capacities of 2, 3½, 5, 4½ and 5½ cu. ft. Breakaway capacity is listed at 9,000 lb.

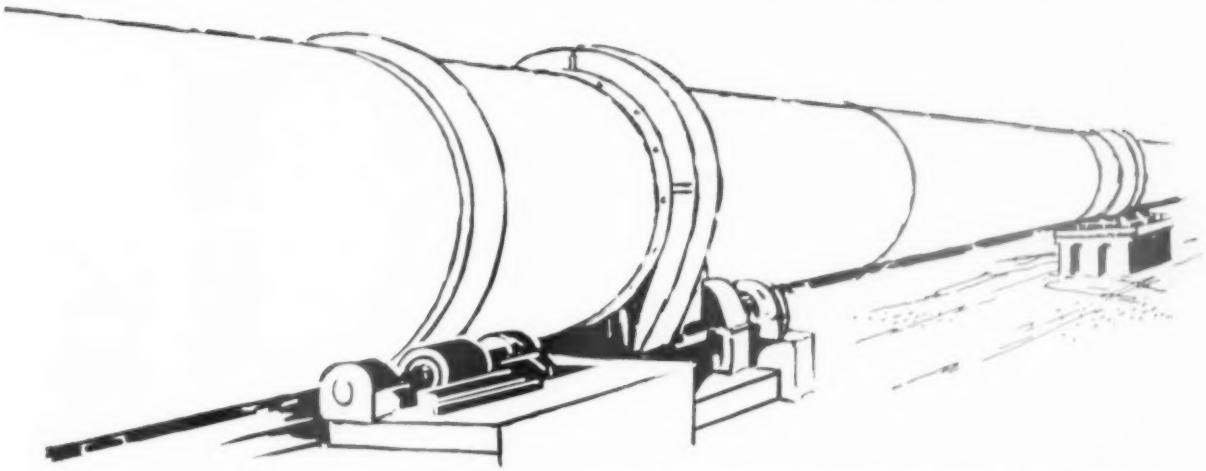
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MANUFACTURERS

NEWS



W. L. Pringle named president

Hercules Motors Corp., Canton, Ohio, announces the election of William L. Pringle as president, succeeding John C. Keplinger who has retired. Mr. Keplinger will retain his position as a director and will continue as an executive consultant. Mr. Pringle was also elected a member of the board of directors.

Also announced, was the election of Henry H. Timken, Jr. as chairman of the board. He succeeds Charles Balough, one of the founders of the company, who has been serving in that capacity and as a director since his retirement as president four years ago. Walter F. Rockwell was elected to the board also.

Cummins Engine Co., Inc., Columbus, Ind., has announced the appointment of Paul J. Every as managing director of the Cummins subsidiary in Shotts, Lanarkshire, Scotland, succeeding D. J. Cummins. Mr. Every had been general sales manager at the Columbus, Ind. plant before being appointed to his new position. Mr. Cummins returns to devote full time to his responsibilties as vice president of engineering. Also announced, was the appointment of Charles E. Martin as general service manager and member of the executive committee, with overall responsibility for the service division. He succeeds H. E. Bollwinkel, who has resigned.

Baker-Raulang Co., Cleveland, Ohio, announces the appointment of Harry P. Wiseman as publicity manager. Mr. Wiseman has accepted the newly created post to develop and disseminate information to newspaper, business and trade publications as a part of the promotional program now being developed by the company.

American Cyanamid Co., New York, N.Y., has signed an agreement with the Illinois Powder Mfg. Co., producer of industrial explosives, providing for the sales of Illinois Powder business and assets to Cyanamid. The transaction is subject to the approval of Illinois Powder stockholders who will vote on the matter at a special stockholders meeting. Illinois Powder will become part of the explosives department of Cyanamid's organic chemicals division. Under terms of the acquisition agreement, Illinois Powder Co. stockholders will receive 88,000 shares of Cyanamid common stock.

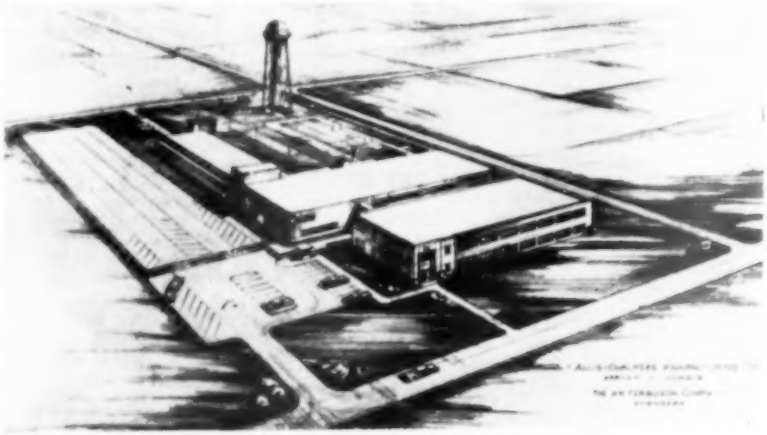
Loomis Machine Co., Tiffin, Ohio, announced it has discontinued operations and that all Loomis replacement parts and service will now be handled by The Sanderson Cyclone Drill Company, Orrville, Ohio.

Noble Co., Oakland, Calif., announces the opening of a new branch office at Dallas, Texas. Robert L. Baxter, formerly of the Los Angeles office, will be in charge of the new branch location. Other administrative changes include: appointment of Robert C. Clark, formerly regional manager, Cleveland office, to the post of sales promotion manager, Oakland; Arthur B. Kinley from Pacific Northwest regional manager, Cleveland office; and Frank Quinn as Pacific Northwest regional manager, Seattle.

American Air Filter Co. Inc., Louisville, Ky., announces that John R. McConnell, former vice president and director of advertising, died August 8, following a short illness, at the age of 69. Mr. McConnell retired last year after 33 years in the air-filter business.

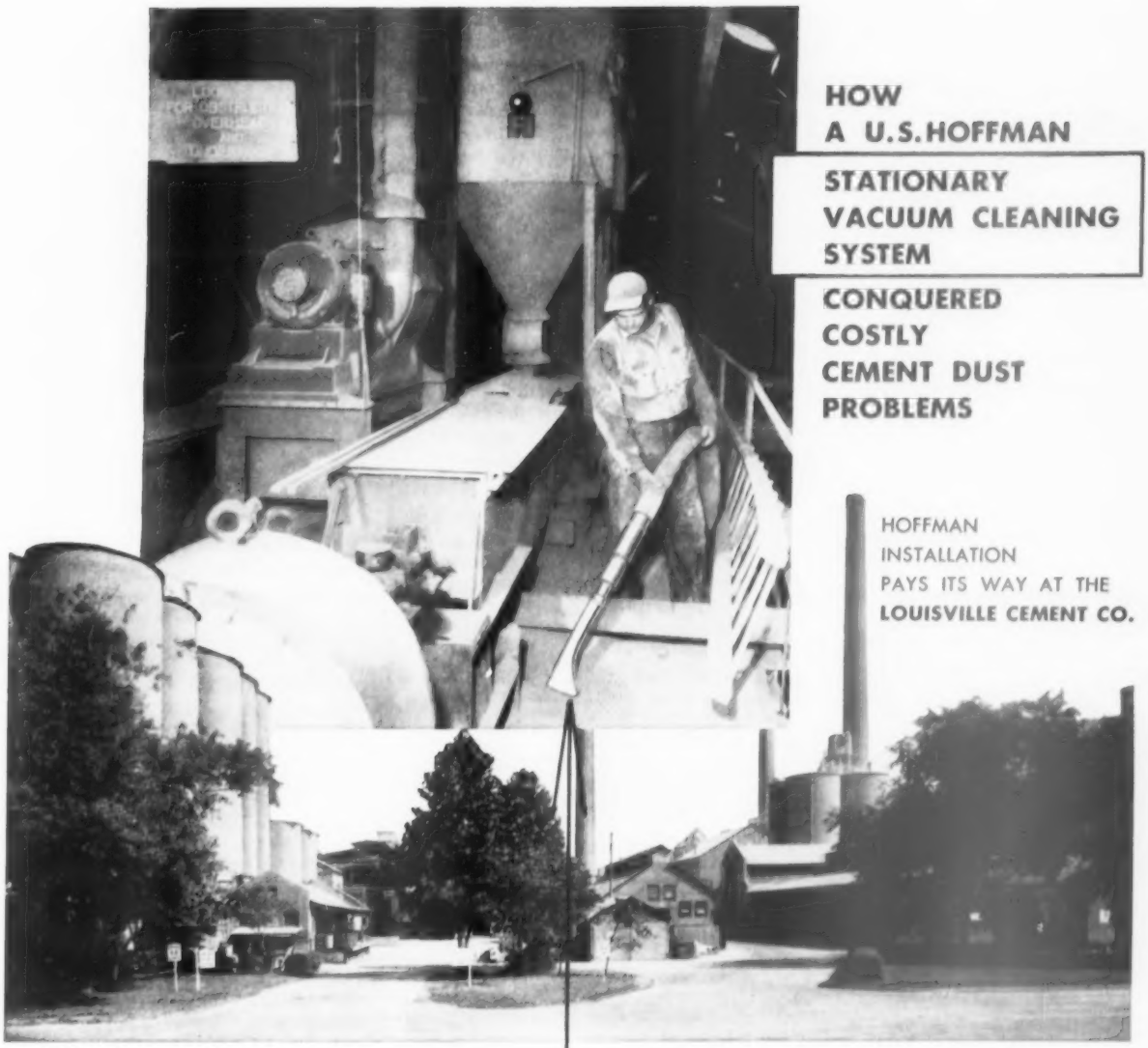
Eaton Mfg. Co., Cleveland, Ohio, has appointed Phillip B. Harrity as employe relations manager of the axle division. Howard M. Thompson was promoted to the central industrial relations department in the general office, and Shepard T. Shedden, assistant employe relations manager of the axle division, was also appointed training director.

Allis-Chalmers to build new laboratory



Allis-Chalmers Mfg. Co., Milwaukee, Wis., broke ground recently for a new $3,250,000 engineering and research laboratory at the Harvey, Ill. plant. When construction is completed next spring, new facilities will include a central engineering building, engine and material handling product development laboratory.

(Continued on page 220)



HOW A U.S.HOFFMAN STATIONARY VACUUM CLEANING SYSTEM CONQUERED COSTLY CEMENT DUST PROBLEMS

HOFFMAN INSTALLATION PAYS ITS WAY AT THE **LOUISVILLE CEMENT CO.**

before

a U.S.Hoffman stationary vacuum cleaning system was put into operation at the Louisville Cement Co., plant in Speed, Indiana, these were among their cement dust problems:

1—**Considerable spillage occurred in loading with little or no salvage.**

2—**Three to four men were required to clean up hopper cars after a day's loading.**

3—**Broom sweeping wasted usable cement and created a health and safety hazard.**

4—**Efficiency was impaired by poor housekeeping resulting from dust ridden plant area and RR sidings.**

5—**Manual removal of cement from overloaded hopper cars and trucks caused costly delays.**

after

the installation of the U. S. Hoffman stationary vacuum system efficiency was increased 100% and these material, time, and labor savings took place:

1—**Cement previously lost in spillage was reclaimed as a saleable product.**

2—**One man and a U.S.Hoffman stationary vacuum system handled the entire cleaning job.**

3—**End to broom sweeping eliminated health and safety hazard, saved cement.**

4—**Improved housekeeping at RR sidings and in plant area increased efficiency and production.**

5—**Savings resulting from speedy vacuum system removal of excess cement alone more than paid for the installation within a year.**

Hoffman INDUSTRIAL VACUUM SYSTEMS Custom Designed For Your Needs

U.S.Hoffman air appliance engineers will be glad to make a survey of vacuum cleaning possibilities in your plant. No obligation of course. Write for Catalog AB-100.

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Other industrial equipment — **PNEUMATIC CONVEYING DIVISION** — Custom Built Systems — **INDUSTRIAL FILTRATION DIVISION**, Machine Tool Coolant Clarifiers — Solvent Recovery Systems — Oil Conditioners.

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MANUFACTURERS NEWS

(Continued from page 218)



J. P. Courtright is mining consultant

Joy Manufacturing Co., Pittsburgh, Pa., has announced the affiliation of John P. Courtright with the company as a consultant on metal mining, quarrying, strip mining and construction problems. Mr. Courtright was formerly president of Marion Power Shovel Co., and has been associated for more than 30 years with the mining and quarrying industries.

Koehring Co., Milwaukee, Wis., has completed negotiations for the purchase of the business and inventory of the Henry & Wright division of Emhart Manufacturing Co., subject to approval by directors of both firms. Details of the transaction were not announced, but no part of the division's die manufacturing space or major equipment is included in the deal.

The Illinois Gear & Machine Co., Chicago, Ill., is spending $2,000,000 in expansion at its South Works in Chicago. Building construction doubles the size of its heavy manufacturing division. The company said, "Use of the new expansion will also make available at the main plant a great deal of badly needed manufacturing space in which it is planned to install a considerable quantity of smaller production machine tools."

Johns-Manville Corp., New York, N.Y., has announced the appointment of Carlton J. O'Neil, vice-president, as general manager of its Celite division. Mr. O'Neil succeeds C. B. Burnett, who is now general manager of the packings and friction materials division. As general manager of the Celite division, Mr. O'Neil will be responsible for the mining, processing and marketing of diatomite and synthetic silicate products. Mr. O'Neil was one of the men responsible for the development of "Fibra-Flo," a combination of asbestos and diatomite used as a filter aid.

Neptune Meter Co., New York, N.Y., has elected William H. Cochrane a director and executive vice-president of the company. As executive vice president, Mr. Cochrane will be responsible for maintaining a close liaison with the corporation's subsidiaries and coordinating policies and operations affecting administration, manufacturing and sales activities.

Atlas Copco Eastern, Inc., was host to Indian Prime Minister Nehru during a trip down into Atlas Copco AB's test mine at Nacka on the outskirts of Stockholm, Sweden. Mr. Nehru went underground after visiting the main factory, to get a first-hand look at modern rock-drilling equipment. Located about 60 ft. beneath the main factory site, the test mine is used in development of new mining equipment and for actual testing of production line output.

Ingersoll Steel Division, Borg-Warner Corp., Chicago, Ill., announces the appointment of Howard E. Morison as vice-president of the division, located at New Castle, Ind.

Directs packaging research



Arkell and Smiths, Canajoharie, N.Y., has announced the appointment of R. P. Kessler as director of research and development. Over the last 11 years, Mr. Kessler has been packaging engineer in addition to directing packaging research.



A. C. Lundgren retires

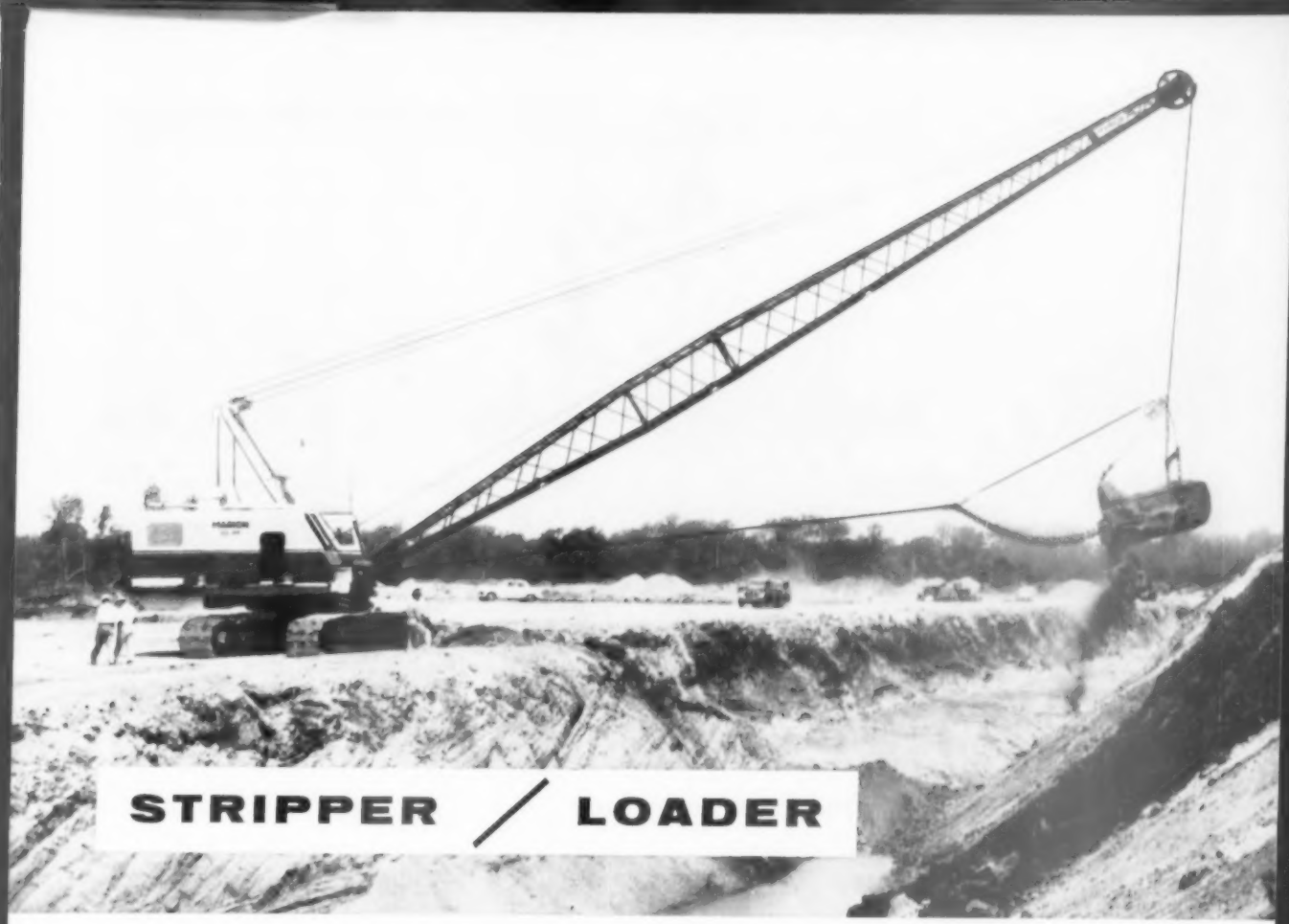
The Thew Shovel Co., Lorain, Ohio, announces that A. C. Lundgren, a director of the company and president of Thew's subsidiary, Byers Machine, Inc., Ravenna, Ohio, has retired. He has been with the organization for 46 years. Mr. Lundgren will continue as a Thew director and is being retained as a consultant on matters pertaining to purchasing and other related company activities.

Harnischfeger Corporation of Canada, Ltd., Toronto, Ontario, a wholly owned subsidiary of Harnischfeger Corporation, Milwaukee, Wis., and Mr. Clyde F. Cameron, president of Maritime Steel & Foundries, Ltd., New Glasgow, Nova Scotia, announce a long-term association of the two companies. This association, comprising a part ownership in Maritime Steel & Foundries by Harnischfeger Corporation of Canada, was established for the purpose of producing and marketing in Canada, all sizes of P & H power cranes and shovels, both crawler and truck mounted.

The Timken Roller Bearing Co., Canton, Ohio, announces the promotion of R. L. Williams to assistant chief engineer of the automotive division. Formerly district sales manager of the industrial division, Columbus, Ohio, Mr. Williams joined the company in 1938 after graduating from Case Institute of Technology, Cleveland, Ohio. He served as sales engineer in Cleveland and then in the St. Thomas, Ontario, office, where he was made a district sales manager. He assumed his post as Columbus district manager, industrial division, in 1955.

(Continued on page 222)

Enter 1623 on Reader Card



Marion 111-M Does Double Duty

A Marion 111-M is "doing a good job on two jobs" at a Texas sand and gravel plant.

Half of its job is to handle the stripping to keep the sand and gravel bank uncovered.

Then it handles all of the loading for a plant that is working two shifts to keep pace with expanded operations.

The Marion 111-M is equipped with a 5-yard bucket on a 90-foot boom, making it one of the biggest machines in this type of work in the Texas area.

The 111-M is a diesel machine, capable of traveling and working almost anywhere. It combines all of the advantages of a diesel machine with the smooth, fast swing action of Ward-Leonard electric control. The diesel power unit drives a generator for the electric swing motors; there are no swing clutches to overheat and no complicated maintenance problem.

Get the complete story on the Marion 111-M and the tough jobs it is handling throughout the world. Your nearest Marion Distributor is the man to see.

MACHINE	Shovel Capacity	AVAILABLE AS . . .			
		Hoe	Crawler Crane	Truck Crane	Special Crane
35-M	¾	Yes	Yes	Yes	—
43-M	1	Yes	Yes	Yes	—
362	1½	Yes	Yes	—	Yes
87-M	—	—	Yes	—	Yes
93-M	2½	Yes	Yes	—	Yes
101-M	3	—	Yes	—	—
111-M	4	—	Yes	—	—

MARION **POWER SHOVEL COMPANY**

A Division of Universal Marion Corporation
Marion, Ohio

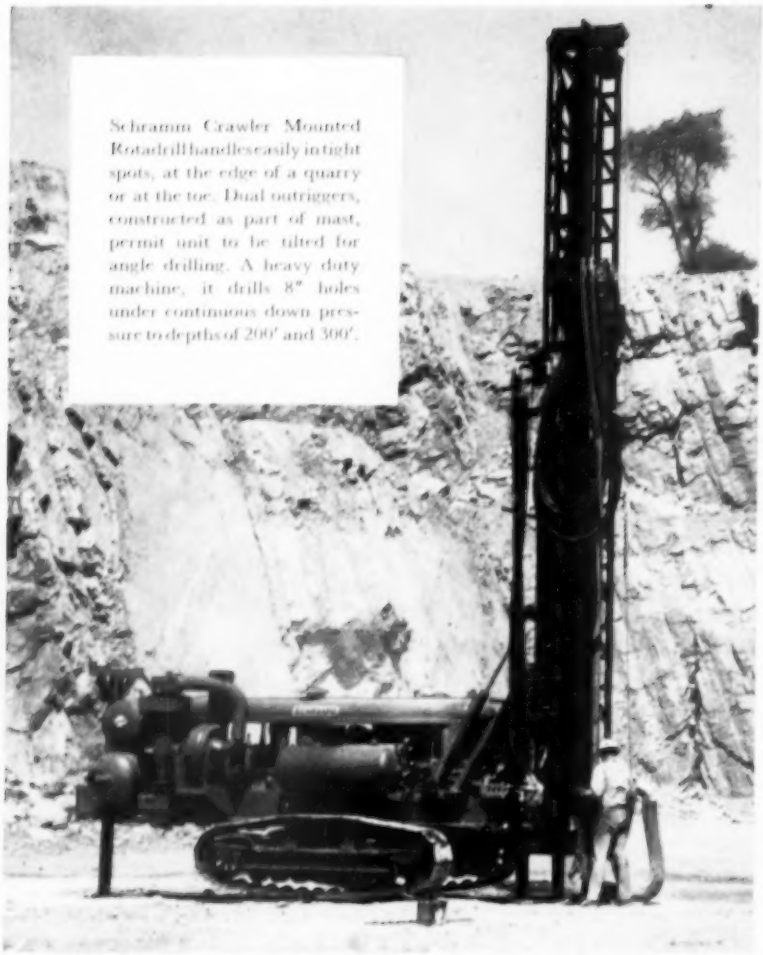
SEND ME information about **MARION** yard shovels, yard hoes and ton cranes (☐ crawler mounted ☐ truck mounted). ☐ Have a salesman call.

NAME TITLE

COMPANY

STREET

CITY ZONE STATE



Announcing the New Schramm Crawler Rotadrill

Crawler Mounted Rotadrill now available at the price of a Truck Mounted Rotary Drill.

Low Cost. Compare! Dollar for dollar and feature for feature, the Schramm Crawler Rotadrill is your best buy in crawler mounted drill rigs. Electric or diesel engine driven, it costs no more than truck mounted rotary drill rigs.

Increased Footage. Hole capacity of 8" to depths of 200' to 300' makes it ideal for modern quarries and strip mines.

Air is supplied by a standard Schramm Model 600 compressor, delivering 600 cfm at 100 psi. Full hydraulic operation, which permits 3-speed rotation of bit, together with automatic continuous downfeed of 28,750 pounds, gives the Crawler Rotadrill its extra fast penetration, cuts down bit wear and eliminates the possibility of delay due to cave-ins and water entry. Where crevices and shattered rock often cause stuck steels, the Schramm Crawler Rotadrill drills up and out . . . saves valuable time.

Highly Maneuverable. Three outriggers, wide treads and low weight per square foot give the new unit outstanding maneuverability and stability. A low center of gravity provides excellent balance . . . it can turn on its own center. Two forward and reverse hydraulic levers provide easy positioning of the unit from hole to hole, or on the longer haul between drilling sites . . . steering clutches have been eliminated.

Other outstanding features include safe, easy access for driver . . . secondary dust collector . . . five lengths of 20' drill pipe carried in the mast. Bulletin CR-57 contains full details. Write for free copy.

Write us for full information, or ask your local Schramm Dealer for a demonstration.

Schramm, Inc.

MANUFACTURERS OF AIR COMPRESSORS

645 North Garfield Ave. • West Chester, Pa.

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MANUFACTURERS NEWS

(Continued from page 220)

Central Scientific Co., Cenco Corp., Chicago, Ill., has announced the appointment of Laird M. Boles as manager of the branch office at Mountainside, N.J. Mr. Boles, who joined the company in 1952, will supervise the sales area from southern New York and eastern Pennsylvania as far south as Virginia.

American Brake Shoe Co., New York, N.Y., has announced the appointment of Albert L. Hunt and Paul J. Bauman as vice presidents of the National Bearing division. As a vice president, Mr. Hunt will be in charge of all manufacturing operations for the division's plants in St. Louis, Mo., Meadville, Pa., and Clearing, Chicago, Ill. Mr. Bauman will be responsible for the industrial sales of the entire division. In other appointments, Francis W. Holbrook was named marketing manager and George L. Essig, sales manager of the AmForge division of the company.

McDowell appointments



P. V. Gallagher



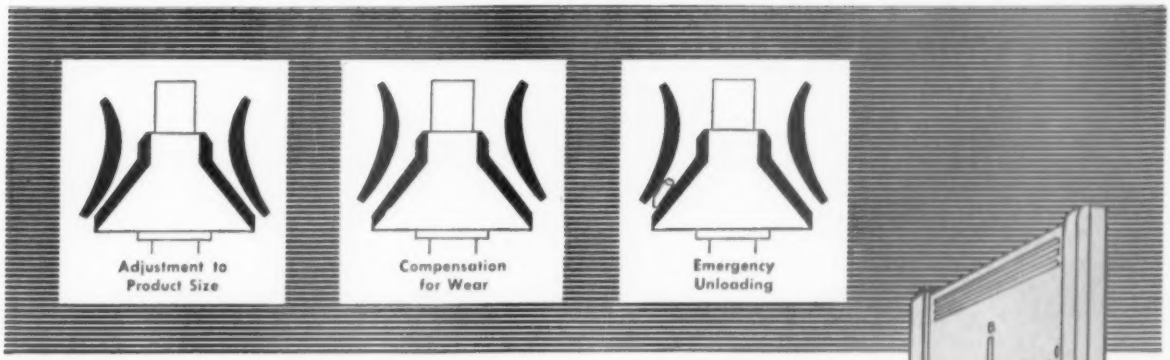
J. R. Perkins

McDowell Co. Inc., Cleveland, Ohio, announces the appointment of Patrick V. Gallagher as vice president of the Dwight-Lloyd division at Port Huron, Mich. A graduate of the University of Maine, Orono, Me., Mr. Gallagher joined the division in 1955, as chief engineer.

John R. Perkins has been named to the newly created post of assistant to the president in charge of market development for McDowell. In this new position, Mr. Perkins will aid in production and sales decisions.

In other appointments, Carl Ludwig was named chief engineer of the engineered products division, Wellman Engineering Co. Mr. Ludwig, a graduate of Case Institute of Technology, Cleveland, Ohio, has been with the company since 1956. Ellison Wefel was named chief engineer of the company's Anker-Holth Division at Port Huron, Mich.

(Continued on page 224)



Only an Allis-Chalmers Crusher gives you

Any Setting at the Flip of a Switch



Hydrocone is an Allis-Chalmers trademark.

HOW long does it take you to change a crusher setting — one hour, two hours, a half day? If it does, your crusher is *eating profits.* But you don't have to put up with a costly, outmoded method of changing setting. With a *Hydrocone* crusher, a flip-of-a-switch operation, called "one-man, one-minute product control," keeps your production schedule intact . . . your tonnage and profits up.

Remember, only an Allis-Chalmers crusher gives you the speed and convenience of "one-man, one-minute product control." For the complete story, see your A-C representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. Ask for Bulletin 07B7145C.

Hydrocone CRUSHER .....*with* One-Man, One-Minute Product Control

ALLIS-CHALMERS

A-5260


Hammermill


Vibrating Screen

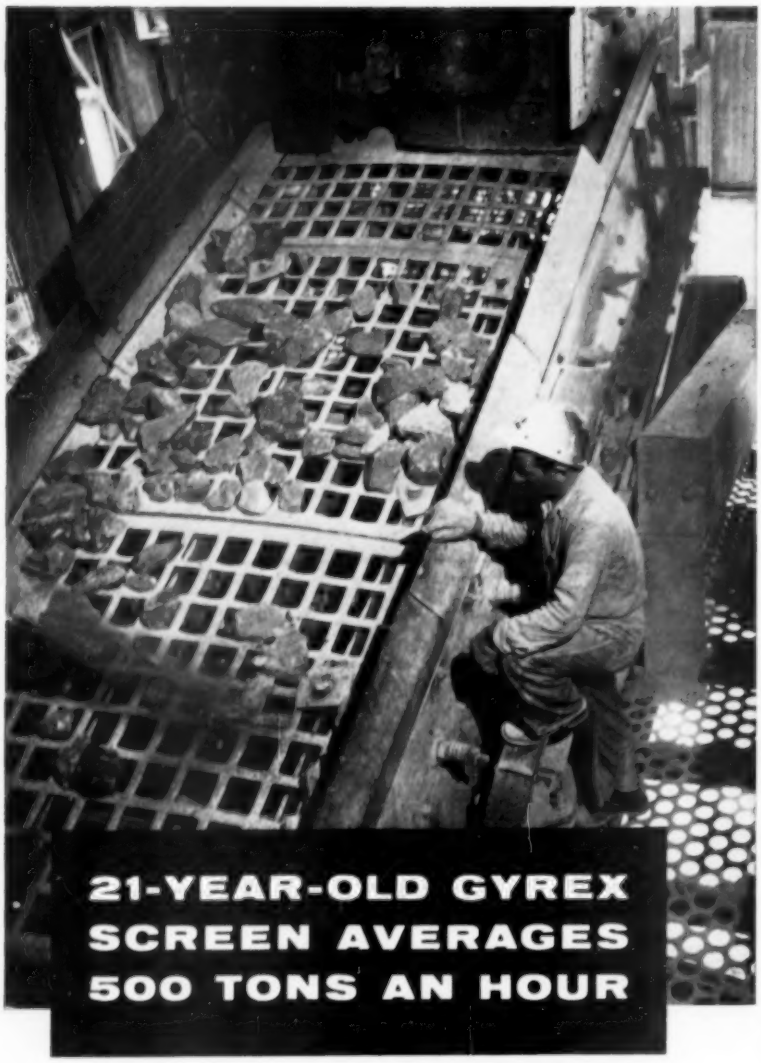

Jaw Crusher


Gyratory Crusher


Grinding Mill


Kiln, Cooler, Dryer

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The Marble Cliff Quarries Company, Columbus, Ohio, separates 500 tons of stone an hour on a Hewitt-Robins Screen. This double-deck Gyrex vibrating unit was installed in 1936 and still has its original eccentric bearings. Main bearings were replaced only once—in 1953 after 17 years of use.

The low upkeep, design flexibility, and high over-the-years productivity of this H-R unit led Marble Cliff Quarries to install a second screen of identical capacity in 1948. And today both units still operate nine hours a day. To find out how H-R products and services can help you, consult your classified telephone directory for the nearest H-R representative, or contact Hewitt-Robins, Stamford, Connecticut.

HR HEWITT-ROBINS

CONVEYOR BELTING AND IDLERS . . . POWER TRANSMISSION DRIVES
INDUSTRIAL HOSE . . . VIBRATING CONVEYORS, SCREENS & SHAKEOUTS

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MANUFACTURERS NEWS

(Continued from page 222)



Safety vehicles in use at Allis-Chalmers plant

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has in operation two safety service vehicles equipped with tools to meet emergency fire or rescue situations and provide Civil Defense preparations at the West Allis plant. One unit, designed for emergency rescue operations is 42 in. wide, 8 ft. long and almost 6 ft. high.

The rescue unit is designed to provide extrication of personnel injured or trapped in an accident where and when normal facilities cannot reach the area. The fire-fighting unit is designed and equipped to fight any type of fire until the West Allis fire department can take over.

Selected personnel on all three shifts of the plant protection department have been training in the use of fire-fighting equipment twice weekly for the past several months. The classes with new trainees at intervals, will go on continuously. Training of maintenance supervisors on all shifts in the use of emergency rescue equipment and first aid is also now in progress according to W. C. Van Cleaf, manager, industrial relations department.

Dominion Brake Shoe Co., Ltd., a Canadian subsidiary of American Brake Shoe Co., has acquired all the physical assets and business of Manitoba Foundries and Steel, Ltd. Manitoba Foundries, formerly a wholly-owned subsidiary of Vulcan Iron and Engineering, Ltd., will become the sixth division of Dominion Brake Shoe.

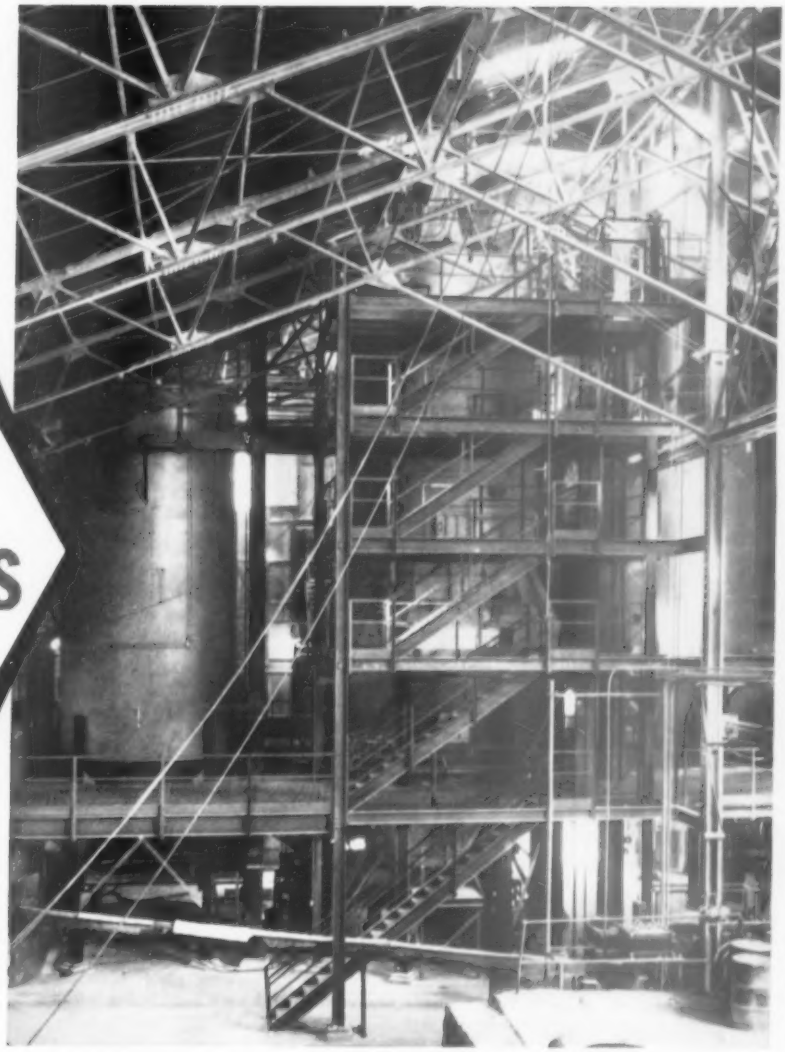
Link-Belt Co., Chicago, Ill., announces the breaking of ground for the company's new $5 million bearing plant in Indianapolis. The new plant will increase by 50 percent the capacity of the present Dodge bearing plant. Construction is expected to be completed in 1958.

(Continued on page 226)

Pioneered and Proven at NELCO...

The Dorrco FluoSolids System

for limestone calcination



A second complete Dorrco FluoSolids System for the production of 100 tons of lime per day . . . an improved version of the existing installation . . . has recently been installed at the Adams, Massachusetts plant of the New England Lime Company. The original System, on stream since 1949 and the first to produce lime commercially by fluidization, is also producing 100 tpd of high quality lime and has firmly established the efficiency and economy of this new calcining method over more conventional methods.

The NELCO operation has conclusively proven that fluidized techniques offer many advantages over previous methods in meeting the prime requirements for calcining limestones . . . significantly . . . high thermal efficiency resulting in notable fuel economy and consistently uniform product of high quality due to closely controlled operating conditions.

Now, application of the same basic principles involved in limestone calcination is indicated in a wide variety of calcining problems. For example, Dorr-Oliver is at present supplying three new installations of multi-compartment units for the handling of a total of 1500 tons per day of western phosphate rock. And there's a good chance that the benefits to be derived from the high capacity-low calcining costs inherent in the Dorrco FluoSolids System may well fit into your plant operations, either existing or proposed.

The knowledge gained from world-wide applications of fluidized techniques plus complete research, development and pilot plant facilities are available . . . we welcome your inquiry. For complete information, write to Dorr-Oliver Incorporated, Stamford, Connecticut.

FluoSolids T.M. Reg. U.S. Pat. Off.

DORR-OLIVER
INCORPORATED
WORLD-WIDE RESEARCH · ENGINEERING · EQUIPMENT
STAMFORD · CONNECTICUT · U.S.A.

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USING SCREEN SEPARATIONS?
NOTHING CLASSIFIES AS
PERFECTLY AS AIR



GAYCO
CENTRIFUGAL
AIR
SEPARATORS

Classify practically all dry fine materials

You get:
- CLOSER SEPARATIONS
- IMPROVED PRODUCTION
- NO UNDESIRABLE OVERSIZE.

RANGE 60 to 400 mesh.
Timken bearings.
Choice of Standard or Heavy-Duty Models.



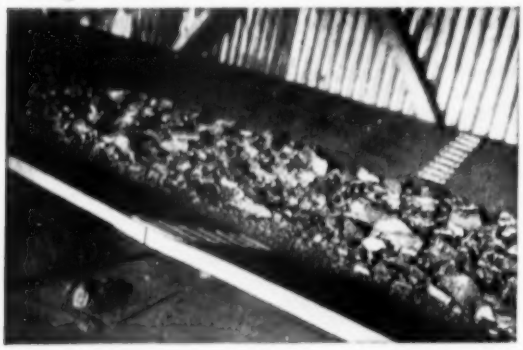
this helpful booklet sent on request

Rubert M. Gay Division
UNIVERSAL ROAD MACHINERY CO.
117 Liberty St., New York 6, N. Y.
Factory and Laboratory: Kingston, N. Y.
In Canada: Watson-Jack Hopkins Ltd., Montreal

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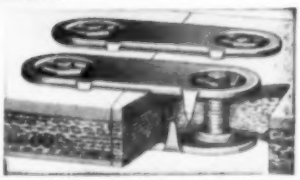
FLEXCO

BELT FASTENERS and RIP PLATES



FOR HEAVY CONVEYOR AND ELEVATOR BELTS OF ANY WIDTH

- ★ FLEXCO Fasteners make tight butt joints of great strength and durability.
- ★ Trough naturally, operate smoothly through take-up pulleys.
- ★ Distribute pull or tension uniformly.
- ★ Made of Steel, Monel, Stainless, Everdur. Also Promal top plates.
- ★ FLEXCO Rip Plates are for bridging soft spots and FLEXCO Fasteners for patching or joining clean straight rips.



Compression Grip distributes strain over whole plate area

Order From Your Supply House. Ask for Bulletin F-112

FLEXIBLE STEEL LACING CO., 4684 Lexington St., Chicago 44, Ill.

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MANUFACTURERS NEWS

(Continued from page 224)

Ellicott Machine Corp., Baltimore, Md., has acquired the floating dredge business of Bucyrus-Erie Co. This acquisition includes all manufacturing rights, drawings, engineering data, patterns, etc. Repair and replacement parts for all dredges built by Bucyrus-Erie will be supplied by Ellicott.

W. K. Dorman made manager



United States Steel Corp., Pittsburgh, Pa., announces that W. Kenneth Dorman has been appointed manager of slag products, succeeding R. K. Plumb who died recently. Mr. Dorman, a graduate of the University of Kansas, Lawrence, Kansas, joined the company in 1937 as a sales trainee. In 1956, he was made assistant manager of slag sales, the position he held at the time of his present appointment.

American Smelting and Refining Co., New York, N.Y., announces that Roger Williams Straus, who retired from his post as chairman of the board in April, died suddenly July 28, at the age of 65. A native of New York City, Mr. Straus joined the company in 1914 after his graduation from Princeton University, Princeton, N.J., was made a director in 1916, and was elected president in 1941. He served in that capacity until 1947, when he became chairman of the board.

Dodge Mfg. Corp., Mishawaka, Ind., announces that Paul Jordan, plant engineer since 1943, has been appointed director of engineering. In his new position, Mr. Jordan will direct all engineering and development work at Dodge.

(Continued on page 228)



PRIMARY PLANTS: Use with Intermediate and Secondary Plants or alone for producing ballast. Jaw crushers 1524 to 3042 in size. Choice of portable apron or built-in feeder. Some have scalping screen ahead of crusher.



IN-LINE GRAVEL PLANT: Extra large capacity with low weight. Meets most highway load limits. Has 1036 jaw crusher, 30" x 24" rolls, 4' x 12' — 2½ deck vibrating screen . . . yet weighs only 55,900 lbs. on the road!



INTERMEDIATE PLANTS: Used with Primary and Secondary Plants to increase flexibility of operation and boost output. Meets highway height, width, and weight limits. Models offer choice of either jaw or roll crusher.



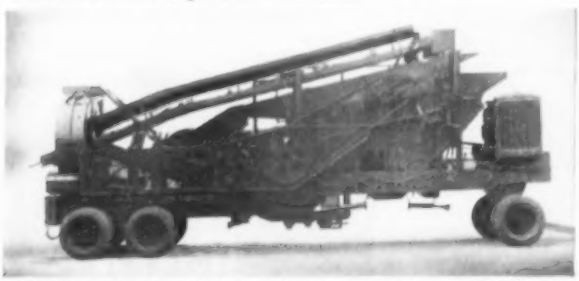
SECONDARY PLANTS: 4 models of Secondary Plants offer choice of 3018, 4022, and 5424 twin roll crushers or 4022 triple roll crusher with 3' x 10', 4' x 10', or 4' x 12' — 3½ deck vibrating screens.

For men who like to underbid their competitors . . . (and make a nice profit, too)

Pioneer Portable Crushing Plants



BOTTOM DECK FEED PLANTS: Exclusive method of routing material through plant gives twice the effective screening area of conventional plants, also lets operator equalize load between jaw and roll crusher while plant is operating. These and other features, give extra capacity and unusual control of gradation. Four models.



44 AND 45 SERIES: Full deck sand screen rejects fines and small rock bypasses jaw crusher. These and regular Bottom Deck Feed features give extra big capacity. 4 full screen decks and spouting arrangement can produce 4 sizes of material at some time. Electric or mechanical drives.

PIONEER Distributors and PIONEER's own field engineers are experienced in all phases of aggregates production. They will be glad to study your project, analyze your needs, then help you design an efficient installation that will fit your need.

Pioneer®
EQUIPMENT

Pioneer Engineering, 3200 Como Avenue S.E., Minneapolis 14, Minnesota
Division of Poor & Company, Inc. • Chicago

Please send information on equipment checked below.

☐ GRAVEL & ROCK PLANTS	☐ JAW CRUSHERS	☐ ORE FEEDERS
☐ WASHING PLANTS	☐ ROLL CRUSHERS	☐ MECHANICAL FEEDERS
☐ BITUMINOUS PLANTS	☐ IMPACT BREAKERS	☐ VIBRATING SCREENS
☐ BITUMINOUS PAVERS	☐ APRON FEEDERS	☐ CONVEYORS

Name _____

Company _____

Address _____

City _____ Zone _____ State _____

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BETTER LUBRICATION



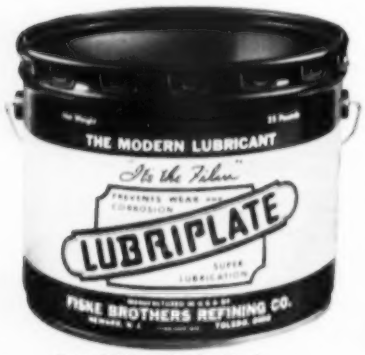
FOR BALL AND ROLLER
BEARINGS

BALL BEARING LUBRIPLATE . . . a most effective grease type lubricant that also protects ball and roller bearings against rust and corrosion. Highly recommended for speeds up to 5,000 RPM and temperatures up to 300° F.

LUBRIPLATE No. 205 . . . an unusually light consistency, grease type lubricant made for use in anti-friction bearings operating at speeds in excess of 5,000 RPM.

LUBRIPLATE Nos. 1, 2, 4 and 8 are fluid type lubricants of various viscosities that have given outstanding results in anti-friction oil type bearings. Nos. 1 and 2 are recommended for high speed applications; nos. 4 and 8 are recommended for slow speed, heavy load applications.

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Write for free "LUBRIPLATE DATA BOOK". . . a valuable treatise on lubrication. LUBRIPLATE DIVISION, Fiske Brothers Refining Company, Newark 5, N. J. or Toledo 5, Ohio.



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MANUFACTURERS NEWS

(Continued form page 226)



Dwight A. Bessmer appointed executive vice president

Timken Roller Bearing Co., Canton, Ohio, announces that Dwight A. Bessmer has been elected executive vice president of the company. Mr. Bessmer, who joined the company in 1933, was named assistant to the president in 1950, and in 1953, was elected a vice president, which position he held until his recent appointment. Mr. Bessmer's new position will include general administrative duties for all plants and offices of the company.

American Marc Inc., Inglewood, Calif., has announced the appointment of Lloyd E. Berry as vice president in charge of sales. Previously, Mr. Berry was distributor in the south and southeastern states.

Babcock & Wilcox Co., New York, N.Y., announces that Isaac Harter, former vice president of the company died August 22, at the age of 77. In the 1920's Mr. Harter became a director of both the Babcock & Wilson Co. and the Babcock & Wilcox Tube Co., now the Tubular products division. As vice president of both companies he was in charge of manufacturing operations. He became chairman of the board of the tube company in 1947 and in 1951 retired from that position to become a consultant.

(Continued on opposite page)

STEEL

Every Kind
Quick Delivery

Plates, Structurals,
Bars, Sheets, Tubes, etc.
Carbon, Alloy, Stainless
Steels, Babbitt Metal.

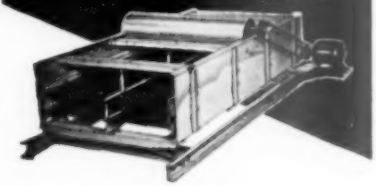
RYERSON

Joseph T. Ryerson & Son, Inc. Plants at New York • Boston • Wallingford, Conn. Philadelphia • Charlotte, N.C. • Cincinnati Cleveland • Detroit • Pittsburgh • Buffalo Chicago • Milwaukee • St. Louis • Los Angeles • San Francisco • Spokane Seattle.

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UNIVERSAL

OFFERS THE BEST IN VIBRATING SCREENS AT THE LOWEST PRICE



Before you buy, be sure to get a copy of the new UNIVERSAL Catalog #1501

There's a model to fit your particular requirement, priced within the smallest budget.

Write today for free catalog #1501

UNIVERSAL VIBRATING SCREEN CO.

Racine, Wisconsin
Quality Screens Since 1919

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MANUFACTURERS NEWS

(Continued from preceding page)



New post for Elmer Kraig

Hewitt-Robins Inc., Stamford, Conn., announces that Elmer E. Kraig has been appointed chief engineer of the newly created rock products engineering department at Glenbrook, Conn. The new department will design and engineer plants for the production of sand, gravel, crushed stone and related materials.

Mr. Kraig has had 35 years experience in the aggregate industry and previous to joining Hewitt-Robins was chief engineer of the Smith Engineering Works, Milwaukee, Wis., where he was responsible for design of stationary and portable aggregate plants.

Massey-Harris-Ferguson, Inc., Racine, Wis., has purchased the assets, patents and designs of Mid-Western Industries, Inc., Wichita, Kansas. Albert A. Thornbrough, Massey-Harris-Ferguson president, said that Mid-Western Products would continue to be marketed under the "Davis" brand name. It is planned to broaden and expand the distribution of Davis products. Mr. Thornbrough said that Mid-Western operations will become part of the Massey-Harris-Ferguson Industrial Division. Charles J. Davis, president of Mid-Western, has been named Division general manager.

Brunner & Lay, Inc., Franklin Park, Ill., has opened a new plant in Canada for the manufacture of tungsten carbide Rok-Bits and tungsten carbide integral drill steel for the mining, quarrying and construction industries. The plant will also manufacture a complete line of pneumatic tool accessories and drill steels.

Ottawa Steel Division, L. A. Young Spring & Wire Corp., Ottawa, Kansas, has announced the appointment of Ivan K. Knight as general sales manager. The division manufactures roadbuilding, materials handling and industrial construction machinery.

Link-Belt Speeder Corp., Cedar Rapids, Iowa, has announced the appointments of Dave Van de Roovaart as assistant sales manager and Duane DeLong as district sales representative for the states of Kentucky, Tennessee, Virginia, West Virginia and North Carolina.

Eaton Mfg. Co., Cleveland, Ohio, has formed a new automotive parts manufacturing company, Eaton S. A. Industria de Pecas e Acessorios, with headquarters in Sao Paulo, Brazil. Tasso Pinheiro, whose company has a minority interest in the new corporation, will be the director-president of Eaton, S. A. Other officers will be selected from the Eaton organization. The new factory will be completed and ready for production early in 1958.

Borg-Warner Corp., Chicago, Ill., has announced the appointment of Richard A. Powley as president of the Pesco products division, Bedford, Ohio, which designs and manufactures industrial hydraulic equipment.

(Continued on following page)

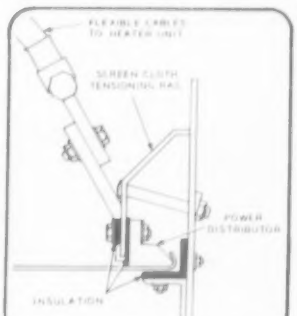
ARE YOUR SCREENING METHODS OBSOLETE?



FOR FASTER, MORE ACCURATE SIZING
USE *Hanco* ELECTRIC SCREEN HEATERS

Today when full speed production is more important than ever before, you cannot afford obsolete methods of screen processing. HANCO electric screen heaters save valuable time, preserve equipment and guarantee good separation of materials at all times. You can eliminate clogging and binding with a HANCO engineered electric screen heater.

HANCO offers engineered heating attachments for *all* makes and types of screening units. For complete information ask for HANCO Bulletin No. 756.



Here is part of the secret to successful screen heating — the rest is HANCO experience and enterprise.

Hanco

F. R. HANNON & SONS

1605 Waynesburg Rd. S.E., Canton 7, Ohio

PIONEERS IN ELECTRIC SCREEN HEATING – FIRST IN THE FIELD OF LOW VOLTAGE AND HIGH AMPERAGE SCREEN HEATING

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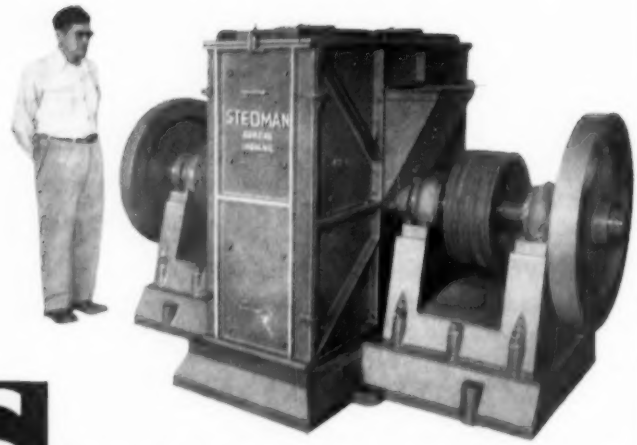
ARE YOUR STONE AND GRAVEL PRODUCTS CUBICAL IN SHAPE?

ARE THEY FREE OF SOFT STONE AND CLAY?

WILL THEY MEET SPECIFICATIONS AND PASS ABRASION TESTS?

DO YOU NEED MORE OF THE FINER SIZES IN YOUR SAND PRODUCTS?

CAN YOU MEET TODAY'S SPECIFICATIONS ON AG LIME?



STEDMAN CRUSHING EQUIPMENT
SOLVES MOST OF THESE PROBLEMS!

Write for complete details on the STEDMAN PRINCIPLE OF IMPACT CRUSHING to meet today's requirements.

MORE THAN A CENTURY OF KNOW-HOW

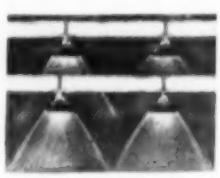
STEDMAN FOUNDRY AND MACHINE COMPANY, INC.

Subsidiary of United Engineering and Foundry Company

AURORA, INDIANA *Founded 1834*

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CONCENCO® Spray Nozzles



These handy spray nozzles are simple, inexpensive and easy to install . . . all you do is drill one oversize hole for each nozzle, clamp on, adjust and get results.

They may be definitely aligned for sheet flow or staggered according to need. Are removed or replaced in a moment's time. Machined orifices assure uniform, accurate performance.

Send for full information.

The DEISTER CONCENTRATOR COMPANY, INC.

915 Glasgow Avenue Fort Wayne, Indiana

Enter 1532 on Reader Card

MANUFACTURERS NEWS

(Continued from page 229)



J. Chadwick fills vacancy

Koehring Co., Milwaukee, Wis., has announced that John S. Conway, vice president in charge of sales, service and advertising for the Koehring division, passed away August 17, after a short illness. He was 51 years of age. John E. Chadwick has been appointed to succeed Mr. Conway. Mr. Chadwick was previously sales manager of the Koehring division.

Caterpillar Tractor Co., Peoria, Ill., announces that construction of a new 500,000 sq. ft. industrial-engine plant has begun on a site 12 miles north of Peoria. The plant will be the first of three facilities built in the 1,100-acre area, with a research center and a general offices buildings planned for future construction. The new industrial engine plant will be completed by early 1959, and will be the source of manufacture for the company's two largest tractor models, the D397 and D375. Work on the three new facilities will be a major part of Caterpillar's current $200 million, three-year building program.

Fuller Co., Catasauqua, Pa., has announced the retirement of Joseph B. Gaffney, consulting engineer since 1952 and chief engineer prior to that. Mr. Gaffney has been with Fuller since 1916 when he was hired as an erection engineer.

American Brake Shoe Co., New York, N.Y., has announced the appointments of Claude E. Christie and William D. Raddatz as vice presidents of its electro-alloys division. Mr. Christie will continue to act as works manager of the division's plant at Elyria, Ohio. As a vice president, Mr. Raddatz will also retain his present position as sales manager.

END

WHERE TO BUY

CLASSIFIED ADVERTISING
RP—WHERE TO BUY—

79 WEST MONROE ST. CHICAGO 3, ILLINOIS

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Lower rates on a contract basis. Write for rate card.

FORMS CLOSE 15th of MONTH PRECEDING PUBLICATION

Jan.	July . . . .
Feb.	Aug. . . . .
Mar.	Sept. . . . .
Apr.	Oct. . . . .
May	Nov. . . . .
June	Dec. . . . .

CHECK MONTHS AD TO APPEAR

Mail to: ROCK PRODUCTS, Where To Buy Dept., 79 West Monroe St., Chicago 3, Illinois

CRANES & SHOVELS

Bantam "M-49" ⅜ yd. Trench Hoe, mounted GMC 6x6.
Sargent "410" New ⅜ yd. Hoe or Crane, mounted on new Crane Carrier. Substantial discount.
Insley "K-12" ½ yd. Trench Hoe, Crane or Dragline. (2).
Lorain "TL25" Used ¾ yd. Diesel Dragline.
Marion "331" ¾ yd. Shovel or Dragline.
Byers "83" Used ¾ yd. Crane or Dragline.
Link Belt Shovel attachment complete for LS-85 (¾ yd.)

LOADERS

Caterpillar "D-4" Diesel Tractor w/Trackson Tractor Shovel. Rebuilt tracks and engine.
Caterpillar "D-6" Diesel Tractor w/Hi-Lift Cable Traxcavator, 1950 model in fine shape.
Allis-Chalmers "HD-5G" Used Diesel Tractor w/Tractomotive Front End Loader, Rebuilt tracks and engine.
International "TD-9" Used Diesel Tractor w/ Bucyrus-Erie Hydraulic Tractor-Dozer.
Pettibone "110" Used 1 yd. Tractor Shovel, 4-wheel drive.
Hough "HM" Used 1½ yd. Tractor Shovel, 4 wheel drive.
Barber-Greene "545-46-3" Used Rubber-Tired Bucket Loader.
Haiss "75W" Used Rubber-Tired Bucket Loader, 2½ yrs. old.
Haiss "75C" Used Crawler Bucket Loader at $2000.

MISCELLANEOUS

Gruendler "1024" Roller Bearing Jaw Crusher.
Pettibone-Wood "820A" New Windrow Proportioner. Reduced for quick sale.
Pettibone-Wood "P620" Used Preparizer, G-M Power, Diesel. Will rent or sell.
Bayport 23 Yd. New Aggregate Bins.
Rex 4½ Yd. Hi-Discharge MotoMixer, Reconditioned, Un-Mounted.
Jaeger 3 Yd. (4½ yd. Agitator) Hi-Discharge mixer, 1945 model, mounted on 6-wheeler. Cheap.

NOTE: This Equipment Located in our Yard

EIGHMY EQUIPMENT COMPANY
120 S. Piepont Phone 4-6706
ROCKFORD, ILLINOIS

WANTED

JAW CRUSHERS, ALL SIZES.
LATE MODEL VIBRATING SCREENS.
GEARMOTORS—3 TO 15 H.P.
GOOD USED TROUGH IDLERS, 18" & 24", ANY AMOUNT.

FOR SALE

DIAMOND PORTABLE CRUSHING PLANT, 15 x 24, PNEUMATICS.
CEDAR RAPIDS 25 YD. SECONDARY PORTABLE CRUSHING PLANT.

Kennedy #19 Secondary Crusher.
Sturtevant #1 Rotary Crusher.
Jeffrey 24 x 18 Pulverizer.
Acme 9" x 16" Jaw Crusher.
Acme 14" x 26" Jaw Crusher.
Climax 10" x 20" Jaw Crusher.
4 Williams Hammermills 50 to 100 HP
8" Encl. Elevator on belt, 57' centers
8" Enclosed Perfect Discharge Elevator
6" Encl. Perfect Discharge Elevator
4' x 40' Dryer, Spare Parts
Two 10' Dia. x 28' Long Tanks
Deister 3 Deck 5' x 10' Screen
Seco Screen 4' x 8' double deck
Seco Screen 4' x 14' triple deck
Two Type 38 4' x 10' Hummers.
Stiffleg Derrick, 15 Ton, 110' Boom
Small Gasoline Water Pumps
Worthington Wagon Drill WP521
DeLaval Worm Gear Reducer with 50 HP Motor 120 R.P.M.
Large V-Belt Drives
3000'—#114 Chain, 6" P. Complete Sprockets drives.
Misc. Size Large Conveyor Pulleys
Trough Idlers 42" & 48" antifriction.
Plain Brg. Idlers, 5 roll type, 20" to 36".
New Idlers, 18" and 24".

G. A. UNVERZAGT & SONS INC.
136 Coit Street, Irvington 11, N.J.

SHOVELS — DRAGLINES
DRILLS
CRANES — EUCLIDS

7400 Marion Dragline, 160', 13 yard
625 Page Diesel Drag, 150', 10 yard
4500 Manitowoc Drag, 120', 5 yard
621-S Page Diesel, 135', 6 yard
7-W Monighan Elec. Drag, 120', 7 yd.
618 Page Diesel Drag, 120', 5 yd.
5-W Bucyrus Monighan Drag, 120', 5 yd.
2400 Lima Dragline, 130', 5 yd.
111-M Marion Diesel Drag, 100', 4 yd.
1055 P&H Dragline, 80', 3½ yd.
1201 Lima Dragline, 85', 3 yd.
1201 Lima Comb. Shovel & Crane
955 P&H Dragline, 90', 2½ yd.
54-B Bucyrus Erie Drag, 85', 2½ yd.
3500 Manitowoc Drag, 85', 2½ yd.
40-A Marion Drag, 90', 2½ yd.
2000-B Manitowoc Cranes
604 & 802 Lima Cranes
151-M Marion Elec. 5 yd. Shovel
4500 Manitowoc 5 yd. H. L. Shovel
1601 Lima 4 yd. Standard Shovel
120-B Bucyrus Erie 4 yd. Electric Shovel
1201 Lima Standard 3½ yd. Shovel
1055 P&H 3½ yd. Standard Shovel
802 Lima Comb. H. L. Shovel & Drag
54-B Bucyrus Erie 2½ Yd. H. L. Shovel
51-B Bucyrus Erie 2 yd. Shovel
Unit 1020 ¾ yard Shovel
P&H, Lorain, Bucyrus Erie Truck Cranes
600 Reich Heavy Truck Mounted Rotary Air Drills
58-BH Joy Champion Rotary Air Drills
McCarthy Coal Auger Drill
Compton Coal Auger Drill
Mayhew Rotary Truck Mounted Air Drills
Portadrill Truck Mounted Air Drill
Euclid Trucks—Bottom & Rear Dumps
Caterpillar, International & Allis-Chalmers Bulldozers
42-T, 29-T, & 27-T Well Drills

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l. Bank Bldg.
Hazleton, Pa. Gladstone 5-3658

BUCYRUS ERIE 7-W DRAGLINE

10 x 78 DRYER. 4' & 3' SYMONS cones.
Pioneer 54 x 24 double roll. 5360 Impactor.
6 x 14 rod mill. 42 x 48 & 84 x 66 jaws.
CRUSHING EQUIPMENT: Jaw Crushers—Rolls—Cones—Gyratories—Rod, Ball & Tube Mills—Hammermills—Impactors—Portable Plants.
Bins — Bucket Elevators — Classifiers — Compressors — Conveyors — Cranes — Derricks — Drills — Dump Cars — Engines — Feeders — Generators — Hoists — Kilns & Dryers — Locomotives — Motors — Pumps — Screens — Shovels & Draglines — Transformers — Euclid Trucks — Weightometers.

Located in All Parts of the Country

Stanley B. Troyer Equipment Co.
Box 97, Phone 500, Crosby, Minnesota

JAW CRUSHERS
60"x48" to 6"x3"
New and used RELIABLE

"Farrel-Bacon" Jaw Crushers

BACON-PIETSCH CO., INC.
26 Park St., Montclair, N. J.
29 Washington Ave., Hamden, Conn.
Phone Montclair—PI 6-1300



BONDED EQUIPMENT BARGAINS

NEW CURRENT MODELS IMMEDIATE SHIPMENT FROM OUR FACTORY - WRITE, WIRE OR PHONE

NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS



BONDED® 8" Jr. I Beam Frame Conveyor

BONDED® Truss Frame Conveyors



Complete Pre-Fab sections of 8" Jr. I Beam or Truss Conveyors, quickly and easily joined together on the job. Both types of conveyors are equipped with 5" roll diam. idlers and return rolls, 20" diam head pulley and 16" diam tail pulley mounted on 2 1/4" or 2 7/16" diam. shaft. Bonded Truss Frame Conveyors are built like a bridge. Designed for long free spans to 50 feet. Constructed of structural angle and reinforced with steel plate. Special high-tensile bolts are used to join all sections. Prices listed are for I Beam Frame Construction. Prices of Truss Frame Conveyors quoted on request. We take our loss on our stock of short length belting. You can save as much as 50% on the BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Belt is new 4-ply 28-oz. duck, 1/8" top rubber cover x 1/32" bottom cover and is fresh stock made by leading manufacturers.

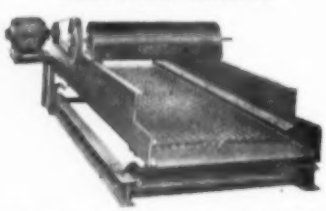
CONVEYOR PRICES INCLUDE BELTING

Belt Width	Length of Conveyor	List Price	Sale Price	Belt Width	Length of Conveyor	List Price	Sale Price
14"	25'	$1397	$722	14"	50'	$2222	$1144
14"	85'	3377	1733	14"	125'	4697	2407
16"	20'	1262	636	16"	45'	2137	1088
16"	60'	2662	1359	16"	90'	3712	1900
18"	25'	1477	794	18"	45'	2217	1166
18"	70'	3142	1648	18"	85'	3697	1933
18"	100'	4252	2220	18"	130'	5362	2797
20"	25'	1517	828	20"	60'	2882	1533
20"	75'	3467	1838	20"	90'	4052	2145
24"	25'	1590	898	24"	45'	2430	1336
24"	70'	3480	1875	24"	100'	4740	2514
24"	120'	5580	2950	24"	150'	6840	3603
30"	50'	2911	1617	30"	70'	3871	2119
30"	90'	4831	2614	30"	140'	7231	3852
36"	25'	1818	1118	36"	45'	2585	1678
36"	60'	3638	2096	36"	100'	5718	3214

For conveyors longer or shorter than those listed above, add or deduct the following per foot prices according to belt width. Prices include belting.

For 14" belt, add $16.84 per foot
For 16" belt, add $18.04 per foot
For 18" belt, add $19.24 per foot
For 20" belt, add $20.37 per foot
For 24" belt, add $21.78 per foot
For 30" belt, add $24.75 per foot
For 36" belt, add $27.95 per foot
Write for Bulletins #1138 and #1189

NEW BONDED® GENERAL DUTY VIBRATING SCREENS



NEW BONDED® HEAVY DUTY VIBRATING SCREENS



For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals, including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry.

GENERAL DUTY SCREENS, TYPE AS: Eccentric weight mechanism, spring mounted, 1 to 3 decks, 2' x 4' to 3' x 8'. Write for Bulletin No. 1086.
Priced from $443.00

HEAVY DUTY MODELS, TYPE BS: Four bearing positive throw eccentric shafts; 3' x 6' to 5' x 14', 1 to 5 decks. Write for Bulletin No. 1087.
Priced from $1,160.00

NEW BONDED® FEEDERS



For high tonnage and controlled feed of Aggregate, Sand, Gravel, Crushed Stone, Clay products, Metallic Ores, Coal, Cinders and almost any other bulk material to Crushers, Screens, Conveyors, Mills and other process machinery. All models available in abrasion resistant alloy steel plate. Capacities to 250 tons per hour. Write for Bull. #1140 & #1182.
Priced from $275.00

NEW BONDED BUCKET ELEVATORS

Open or Enclosed Vertical or Inclined Bucket Elevators with continuous or spaced buckets mounted on chain or belt. For small to medium size lumps, fine abrasive material such as dry sand, coke breeze, wet slag, many other bulk materials. Prices quoted on request. Write for Bull. #1047.

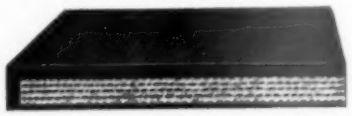
BONDED CONVEYOR ACCESSORIES



Head & Tail	Wing Pulley	Guide Idler
$149.00	$71.00	$14.50

NEW CONVEYOR BELTING SAVE UP TO 25%

Heavy duty 4-ply, 28 oz. duck 1/8" top rubber cover by 1/32" bottom cover 12# to 15# average friction pull; 800# to 1000# average cover tensile rubber belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stock.



Width	Ply	List Price	Sale Price
14"	4	$3.52 foot	$2.83 foot
16"	4	3.96 foot	2.97 foot
18"	4	4.38 foot	3.29 foot
20"	4	4.83 foot	3.80 foot
24"	4	5.68 foot	4.26 foot
30"	4	6.97 foot	5.21 foot
36"	4	8.26 foot	6.18 foot

A high grade of heavy duty 4 and 5-ply, 28 oz. duck, 1/8" top rubber cover x 1/32" bottom rubber cover, 16# to 19# average friction pull, 2500# to 3000# average cover tensile belting. This belt is for more severe service, high tonnages and abrasion resistance. For handling stone, mineral ores, concrete, cement, coal and other similar materials, both wet and dry. Belt has molded rubber edge.

Width	Ply	List Price	Sale Price
16"	4	$4.71 foot	$3.46 foot
18"	4	5.23 foot	3.83 foot
20"	4	5.73 foot	4.37 foot
24"	4	6.74 foot	4.94 foot
30"	4	8.28 foot	6.07 foot
24"	5	7.90 foot	5.78 foot

The following belts are 5-ply, 32 oz. duck:

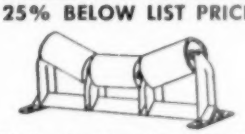
Width	Top Cover	Bottom Cover	List Price	Sale Price
24"	1/8"	1/32"	$ 8.56 Ft.	$ 6.42 Ft.
30"	1/8"	1/32"	10.52 Ft.	7.89 Ft.
36"	1/8"	1/32"	14.21 Ft.	10.66 Ft.

A heavier duty 28 oz. duck belt with 1/8" top rubber cover x 1/32" bottom rubber cover having 3500# to 4000# average cover tensile, 20# to 24# average friction pull. For the higher abrasion resistance applications and handling of materials where more strength is required to give greater belt life.

Width	Ply	List Price	Sale Price
18"	4	$5.67 foot	$4.20 foot
20"	4	6.22 foot	4.61 foot
24"	4	7.32 foot	5.41 foot
24"	5	8.53 foot	6.31 foot

Other widths, plies, duck weights and cover thicknesses available at low prices. Write for Free Sample.

NEW IDLERS AND RETURN ROLLS 25% BELOW LIST PRICE



3-roll, 5" diameter Troughing Idlers for:

14" belt	$18.50	24" belt	$21.25
16" belt	19.25	30" belt	22.00
18" belt	20.50	36" belt	22.75
20" belt	20.75	48" belt	25.50

1-roll, 5" diameter Return Idlers for:

14" belt	$7.25	24" belt	$ 8.50
16" belt	7.50	30" belt	9.50
18" belt	8.00	36" belt	10.00
20" belt	8.25	48" belt	11.50

All steel. Interchangeable with other well-known makes. Furnished with easily replaceable prelubricated Sealed ball bearings. Also can be furnished with greasable type Alemite Fitted bearings at slight additional cost. Maintenance is negligible. Bonded Rubber Disc Impact Idlers priced from $61.00. Write For Bulletin #1138.

BONDED SCALE AND MACHINE COMPANY

PHONE Days: Hickory 4-2186 — WRITE FOR FREE CATALOG AND PRICES — PHONE Evenings: AX. 1-2213, HU 6-3156

128 Bellevue — Mfrs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers and Feeders — COLUMBUS 7, OHIO

SPECIAL ITEMS

Belt conveyors 24", 30", 36" individual units.
Complete 5 Gramm 78 bbl cement bulkers w. Onan engines and compressors w/air outlets into tanks.
B428 faceless Mack batchers; handle 4 batches ea.
Euclid Model 10HV loader, Diesel, 54" belt 38'6"
Sierra Model C30 loader, Cat. D318 Diesel. Belt 48" x 30'
Bucket elevator inclined 120°, 14"x8"x8½" buckets
Cat. 6 Traxcavator 18" triple grouser tracks 2¼ yd bucket w/teeth.
Cat. HT4 Traxcavator 1¼ yd hydraulic bucket
Cat D7 Tractor Cat #46 hydraulic control 7S blade
Martin C25 Trailer, 25 tons capacity

CONCRETE MIXERS

Ransome Model 84S, 3 yd. tilting type
Smith 42Z, 4 yd. tilting type
Koehring 56S 2 yd. tilting type
Koehring 28S 1 yd. stationary type

TRUCK MIXERS

20 Jaeger, REX, Smith 3 to 6½ cu. yd. high discharge, horizontal, truck mounted.

CRUSHERS—KILNS—DRYERS

Jaw: Acme 10x20, 15x36, 14x26, 14x28, 10x42, 16x32, 18x32, 25x40. Eagle 10x16, 20x36. Diamond 24x36". Cedar Rapids 10x20, 15x36, 20x36, 25x40. Farrell 10x20, 18x30, 14x36, 18x36, 36x48. Superhanan Type C 30x42, 36x42. Traylor 18x36, 24x36. Allis-Chalmers 30x18. Good Roads 10x30. Telsmith 18x32. Pioneer 30x42. Universal 18x24.
GYRATORY: Al-Chal 322, 6", 7½", 8, 9, 9K, 10, 16, 20, 30, 42, Telsmith 8S, 28" Intercone,; Kennedy Van Saun 7, 19, 25½, 8, 37½, 38; Traylor TY 1'8", 4' Type TS, TY 3', TZ 3', TZ 3'.
ROLL: Cedar Rapids 40x20. Pioneer 40x22. Pioneer 30x18. Telsmith 24x16. Universal 40x24, 18x30.
HAMMERMILL: Jeffrey Type B3 24x20, Type B 36x24, 36x36, 36x42, Eagle 24x24, Stedman 24x30, Cedar Rapids 50-50, 30x33. Penn Model 8XR 100
BALL MILL: Hardinge conical 8'x36", 8'x18". Gates 5'x22". Marcy 77, Int. X-18 5'x6'
TUBE MILLS: 6'6" x 21' Smidth, 5' x 16' A-C.
ROD MILL: 3' x 8' Denver, 3' x 6' Marcy, 4' x 10' J&C (Never used)
AUTOCLAVES: 2 Jackson & Church 6' x 50', bolter head, 3 8'6" x 120' Besser
CONE: Symons 2', 3', 4', and 4½' coarse bowl.
KILNS: 4'x42', 5'x30', 6'x50'6", 6'4"x45', 6'x72', Vulcan 9x100, 10'6"x105', 8'x10', 6'x90', 6'x72'.
DRYERS: 6'x60', 6'x72', 5'x24', 4'6"x32', 3'6"x20', 6'x30'.
COMPEB MILLS: A-C 7'x24' with motor drive.

CRUSHING PLANTS

Cedar-Rapids AA-2225 primary port. Diesel.
Cedar-Rapids 3033 hammermill Diesel. Trailer mtd.
Eagle washing plant, classifier sand screws, screen.
C-R "Pitmaster" 10 x 16 jaw, 16 x 6 roll
Pioneer Port. 3042 **New** 1955 **Never used.**
Diamond 65 port. gravel 10 x 20 jaw, 30 x 18.
C-R Primary Port. 22 x 36 Jaw, Diesel.
Pioneer Duplex Prim. 936 AFB Second, 2040 rolls.
Aus-Weat. 2540 Port. Primary.
Pioneer Port. 11x36 jaw, 40x20 rolls.
Pioneer 24V Gravel Plant.
Amer. Good Roads 15x30, Diesel. Complete.
Universal 20x36 jaw, 30"x18" roll, plant complete.

CONCRETE PLANTS AND EQUIPMENT

Johnson TY-276 150 yds 3 compt. aggr. 280 bbl cement silo 520 bbls.
Noble CA 506, 500 ton 6 compt. aggr. bin silo 2000 cu. ft. complete.
Standley 100 yd. 4 compt. aggr. bin 850 bbl. cement silo. Complete. Excellent.
Blaw-Knox 100 ton 3 compartment aggr. 3 beam scales weighbatcher.
Butler 150 ton 3 compt. aggr. bin w/weighbatcher.
Johnson 120 ton 4 aggr. compt. cement compt. 85 bbls U.S. Engrs. Corps spec.
B-K P316 new 1956, 3 compt. 100 tons aggr. 400 bbls HI LO cement, 4 yd Smith Mixers.
Erie CTES 160 yd 4 compt. 3 aggr. one cement 310 bbls 850 bbls silos. New 1955.
Johnson 105 ton 3 compartment aggregate
Cement bin 250 bbls overhead storage with 375 bbls cement recirculator ground storage silo
Fuller Kinyon Type C 6" cement unloader.
Johnson 165T, 3compt. aggr., batcher, comp., new '54.
Rex 160, 190, 200 Pumperetes, complete.

SAND AND GRAVEL HYDRAULIC DREDGES

Morris 16"x14". Portable. Electric.
10" Portable Diesel powered. Complete.
12" Diesel powered, pontoon mounted. Complete.
Ellicott 8" with cutter. Diesel Hull 48'x18'x3'6".
20" Ellicott Diesel 155'x49'x8'.
8" Hydraulic Diesel. On 32'x8' steel pontoons.
Amsco 10" Diesel power portable. Excellent.
6" portable Diesel complete with cutters, etc.
8" H&R twin Diesel drive. Complete.

SCREENS

Tyler F-360 4'x12' 2 deck w/spray bars.
Trommel 6'x15' 75 H.P. elec. motor.
Kennedy Van Saun 3'x10' 3 deck.
Tyler-Niagara 3 deck 7½ H.P. A.C. motor.
New Holland 4'x12' 4 deck.
Telsmith 5'x12' dbl. deck elec. motor.

RICHARD P. WALSH CO.
30 Church St. New York 7, N.Y.
CO 7-0723 Cable: RICHWALSH

QUARRY EQUIPMENT

Cedarapids 2540 jaw only. Rebuilt.
Cedarapids 1836 twin jaw crusher. Good.
Cedarapids 936 Jaw Crusher.
Cedarapids 3042 Double Impeller. Rebuilt.
Cedarapids 1024 single pass plant on rubber.
Telsmith 24" cone crusher. Good.
12"x35' inclined open elevator. New.
2—Cedarapids 4'x12' double deck AO screens.
Cedarapids 4'x12' triple deck screen.
Cedarapids 4' x 14 double deck screen.
New Holland 4' x 12' double deck screen.
Pioneer 4'x8' double deck screen.
Smithco 24"x87' lattice frame conveyor.
Smithco 24" x 60' portable belt conveyor.
27½ ton, single-compartment 8'x12' bin.
60-ton, two-compartment, 8'x18' storage bin with clam gates.
100-ton, two-compartment, 13'x23' bin.
Special bins to your specifications.
Conveyors—18"—24"—30"—36". Also conveyor belting.

SHOVELS AND CRANES

Lorain 820 2-yd. diesel shovel-crane.
Lorain 82, 2-yard diesel shovel.
Lorain 79-J- 1½ yd. diesel dragline.
Lorain 79 1½ yd. diesel shovel.
P&H 655B 1½ yd. diesel dragline.
2—Bucyrus-Erie 38B, 1½-yard diesel draglines.
Lorain L-50K 1 yd. diesel shovel.
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Link Belt LS-85 ¾-yard diesel shovel-drag.
Lima 34 Paymaster ¾-yard diesel shovel. Good.
Unit 1020 ¾-yard diesel powered shovel-crane.
Lorain L-26 ¾-yard diesel powered clamshell.
Lorain L-40 ¾-yard diesel clam-drag shovel.
Lorain TL-20 diesel powered backhoe.
Link Belt LS-50 backhoe, gas power.
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Lorain MC-504-W crane clam. Reconditioned.
Lorain MC-414 20-ton Moto-Crane.
Browning T-15-C 17½ ton truck crane.
Link Belt HC90 25-ton truck crane.

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1—Caterpillar DW-10 with Athey side dump.
1—Allis Chalmers HD-10 tractor with hydraulic bulldozer blade.
1—International 300 tractor, with loader, backhoe.
1—International TD-14A tractor with PCU.
1—International TD18 with Bucyrus-Erie bulldozer blade. Excellent condition.
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1—Caterpillar D-8 with cable bulldozer blade.
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Lorain 820, 2-yd., 23' boom, 21' stick.
Lorain 50, 1-yd., 21' boom, 17' stick.
Lorain 40, ¾-yd., 19' boom, 16' stick.
Lorain 30A, ½-yd., 16' boom, 13'4" stick.
Osgood 903, 2-yd., 24' boom, 20'6" stick.

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Lorain 50, 19' boom, 7' stick, 48" bucket.
Lorain 40A, 18' boom, 7' stick, 28", 36" or 44" bucket.
Koehring 304, 19' 10" boom, 5'6" stick, 38" bucket.

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1—Ruggles Cole, Class A-8, 5' x 30' Rotary Dryer, ⅜" shell.
3—Louisville 6' x 50' Rotary Steam Tube Dryers.
2—Link Belt 6'4" x 24', 5'2" x 20' Roto-Louvre Dryers.
1—Link Belt 11'6" x 36' Roto-Louvre Dryer.

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1—Patterson 8' x 18' Silex-Lined Tube Mill.
4—Abbe Engineering 6' x 15' Silex-lined Batch Pebble Mills 40 HP motor.
1—Abbe Engineering 6' x 15' Silex-lined Tube Mill 75 HP motor.
3—Patterson 6' x 8' Unlined Ball Mills.
1—International 6' x 7' Porcelain-lined Pebble Mill 30 HP motor.
1—Dixie #3620 Non-Clog Hammer Mill.
2—Stedman 40" dia. Six Cage Disintegrators, two 40 HP motors.
1—Kennedy Van Saun 4'6" x 6' Airswept Tube Mill.
1—Williams Slugger Hammer Mill 30 Hp motor.
1—Allis Chalmers 24" x 12" Jaw Crusher.
1—Allis Chalmers 36" x 16" Crushing Rolls.
3—Jeffrey 20" x 12", 15" x 8" Hammer Mills.

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1—Raymond 8' dia. Double Whizzer Air Separator.
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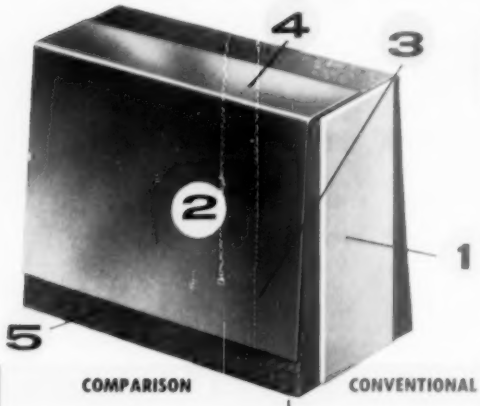
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COMPARISON	CONVENTIONAL BRICK	KAISER UNITAB LINERS	UNITAB LINER FEATURE
Cardboard spacers for longitudinal expansion	Install by hand	Attached to brick at factory	Combustible spacer automatically provides correct allowance for longitudinal expansion (between rings)
Steel plates between bricks for bonding	Install by hand	Attached to brick at factory	Bonding shim to liner assures automatic placement of shim
Provision for circumferential expansion	Install cardboard spacers by hand	Expansion provided by thickness of adhesive that bonds shim to brick	Thickness of combustible adhesive provides correct allowance for circumferential expansion (within ring)
Hot face indicator	No hot face indicator	Clearly identified by touch or sight	Plate overlapping hot face makes visual inspection quick—easy to see that each brick is correctly installed
Effect on reducing shell temperature	None	Design provides heat buffer to reduce shell temperature	Half-inch gap between end of shim and shell acts as heat buffer to reduce shell temperature for greater kiln efficiency

*The product name "Unitab" is a trademark of Kaiser Aluminum & Chemical Corporation, and succeeds the former name "Unitized Kiln Liner T3." Patents for Unitab Liners have been applied for in the U.S.A. and foreign countries

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